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Office of the City Manager

INFORMATION CALENDAR
April 28, 2020

To: Honorable Mayor and Members of the City Council

From: Dee Williams-Ridley, City Manager

Submitted by: Timothy Burroughs, Director, Planning and Development Department

Subject: Eight previous referrals to the Planning Department which can be tracked as fulfilled

INTRODUCTION

The Planning and Development Department proposes that eight previous referrals be deemed "fulfilled" and removed from the City Clerk's tracking list. In each case, the goals of the referrals listed below have been met through either local or state action since the last time Council considered its annual Reweighted Range Voting (RRV) process for referral prioritization.

CURRENT SITUATION AND ITS EFFECTS

This section lists each of the referrals now proposed for closure, background on the original Council request, and a description of which actions lead staff to conclude that the goals of the referral have now been fulfilled.

Toxic Remediation:

- Original referral date: May 1, 2012 (see Attachment 1)
- Sponsors: Councilmembers Moore, Wozniak
- Referred to: Planning Commission
- Goal: Facilitate remediation of sites with toxic contamination by amending the Zoning Code to streamline demolition permitting for purposes of remediation.
- Status: Considered and Not Adopted by Commission

  On September 4, 2019, the Planning Commission considered proposed changes to the Zoning Ordinance which would have allowed issuance of a demolition permit, under certain circumstances and with required findings, even in the absence of a proposed project to replace the demolished structure. Provisions already exist in Berkeley Municipal Code (BMC) Section 23C.08.050 to require remediation of toxic conditions on a site in conjunction with a proposed new development or reuse project, or in certain other specific circumstances when appropriate findings can be made. But current law also requires an approved project to replace the structures prior to issuance of a demolition permit. The current policy is consciously devised to tie permit applications which request

demolition of structures in order to remediate toxic conditions to a specific development project, not the creation of empty lots.

This referral was motivated by a situation where owners of a site at 2222 Third Street wanted to demolish the existing structures and remediate the known toxic conditions prior to deciding what replacement project to propose. In that case, the structures at the site were demolished using existing legal authority and findings, rendering the immediate goal of this referral moot. During the September 4, 2019 discussions, Planning Commissioners and staff could not recall any other actual cases which fit the conditions contemplated by the 2012 referral (proposing to demolish structures and remediate toxic soils within a manufacturing district without also proposing a subsequent development plan).

At that Planning Commission meeting, public comment was taken from stakeholders interested in preserving opportunities for light industrial and manufacturing types of uses in the West Berkeley Plan Area. The public and Commissioners worried that amending the Zoning Ordinance to allow demolition without a replacement project proposed, no matter how well-intentioned, could have negative effects on preservation of such uses by incentivizing demolitions without a commitment to new uses which were consistent with the Plan Area goals.

By a vote of 6-1-0-2, the Planning Commission directed staff to prepare a report to close-out the referral, since the conditions in which the referral was made are no longer relevant. (Ayes: Beach, Lacey, Schildt, Vincent, Wiblin, and Wrenn. Noes: Martinot. Abstain: None. Absent: Fong and Kapla.)

Permit Streamlining for projects with 50% or more affordable units:

- Original referral date: January 19, 2016 (see Attachment 2)
- Sponsor: Councilmember Worthington
- Referred to: City Manager (Planning Department)
- Goal: Facilitate affordable housing by reducing or eliminating discretionary permit review processes when a proposed project includes half or more affordable units on-site, with 20% reserved for Very Low Income households (those making 50% or less of the Area Median Income (AMI)).
- Status: Goals substantively met via State and City legislation. Senate Bill 35, authored by State Senator Weiner, was signed into law by then-Governor Brown on September 29, 2017. Among other requirements, SB 35 mandated streamlined, ministerial approval of any housing development proposing to include 50% or more units affordable to low income-households (those making 80% or less of the AMI). The City has given expedited approval to three projects proposed under SB 35 to date.

Berkeley Ordinance 7,573-N.S., authored by Councilmember Hahn and adopted on September 12, 2017[1], requires expedited review of any proposed project which receives City of Berkeley Housing Trust Funds. Planning staff now prioritize and streamline the review of all such projects.

Since the 2016 referral contemplated a local program that required deeper affordability levels (50% or more of the units for very low-income households) than those required by the State in SB 35 (50% or more of the units at 80% for low income households), developers would have less incentive to opt for a local program.

Since state law largely addressed the streamlining, staff focused on incentivizing higher percentages of affordability. The Draft Adeline Corridor Specific Plan proposes to increase on-site affordable housing provided in market rate buildings through two paths: 1) by introducing new density standards that will generate a higher number of affordable units, even in market rate buildings when applicants choose to apply the State Density Bonus; and 2) by offering a new on-site affordable housing incentive, projects can produce an even higher share of affordable units in exchange for greater densities than current practice would allow. The City also issued an Administrative Regulation[2] that interpreted Government Code Section 65915(n) such that projects can build to the maximum Floor Area Ratio (FAR) if 90% of the units are offered as deed-restricted below market rate units for 55-years. These two local programs can be paired with SB-35 to both streamline and incentivize affordable housing projects.

Ministerial approval for projects with 50% or more affordable units and/or receiving City Housing trust funding:

- Original referral date: December 5, 2017 (see Attachment 3)
- Primary Sponsor: Councilmembers Droste, Bartlett, Worthington, and Mayor Arreguin
- Referred to: City Manager (Planning Department) and Planning Commission
- Goal: Facilitate affordable housing by conferring ministerial zoning approval for any project which received Housing Trust Fund monies, and/or includes half or more affordable units on-site, with 20% reserved for Very Low Income households.
- Status: Goals substantively met via State legislation. SB 35, described in more detail above, has the effect of removing discretionary zoning review procedures for projects in Berkeley which meet objective planning standards and which

[1] https://www.cityofberkeley.info/Clerk/City_Council/2017/09_Sep/Documents/2017-10-03_Item_03_Expedited_Review_for_Affordable.aspx
[2] https://www.cityofberkeley.info/uploadedFiles/Clerk/Level_3_-_General/Local%20Density%20Bonus%20101519.pdf

comprise half or more affordable units. Since this 2017 referral contemplated deeper affordability levels than those set in SB 35, developers would have no incentive to opt for a local program. As with the streamlining referral above, these goals are augmented by other recent City steps to clarify and implement Density Bonus regulations, which also help promote the goal increasing numbers of affordable units.

Waive mitigation and impact fees for projects which receive City Housing Trust Funding, and encourage the Berkeley Unified School District (BUSD) to do the same:

- Original referral date: September 12, 2017 (see Attachment 4)
- Sponsors: Councilmembers Hahn, Harrison, and Mayor Arreguin
- Referred to: City Manager (Planning Department)
- Goal: Lessen the cost of providing affordable housing by waiving mitigation and impact fees which can add substantial project costs.
- Status: Authority to waive such fees already exists. Within the City Zoning Ordinance, BMC Section 23B.24.040.C reads, in part: "*The City Manager may waive or defer the payment of Permit fees, if he or she finds that the project will provide a significant public service or benefit, and that the waiver or deferral is necessary to make the project economically feasible to construct or establish.*" This authority has been used on several previous projects of public interest, including the Ed Roberts Campus, the Biofuel Oasis, and an AHA Affordable Housing project at 2500 Hillegass.

  BMC Section 22.20.080 also provides authority to waive certain requirements when it states that:

  A. Notwithstanding any other provision of this chapter, the requirements of this chapter in the discretion of the City may be waived or limited for a particular development project where both of the following findings are made:
  1. The imposition of the mitigation and/or fees otherwise required by the City make the development of the particular project infeasible; and
  2. The benefits to the City from the particular development project outweigh its burdens in terms of increased demand for affordable housing, child care and/or public facilities, adequate employment training and placement services and/or amenities and/or other impacts which reasonably may be anticipated to be generated by and/or attributable to the development project.

  Finally, projects receiving City Housing Trust Funds are already exempt from Affordable Housing Mitigation fees, under BMC Section 22.20.065, part C.5, which states that "Units that meet the criteria established for affordable housing

rents in the City's Housing Trust Fund guidelines, as amended shall be exempt from the Fee."

Pursuant to this Council request, staff is prepared to send a letter to the Berkeley Unified School District asking that it also consider provisions to waive its impact fees for projects of significant public benefit, such as affordable and/or teacher-focused housing.

Ordinance to allow "Junior" Accessory Dwelling Units (ADUs):

- Original referral date: May 2, 2017 (see Attachment 5)
- Sponsors: Councilmembers Wengraf, Harrison
- Referred to: Planning Commission
- Goal: Develop ordinance language for Council adoption which would allow Junior ADUs, as defined in the referral as "re-purposing a bedroom and ancillary space…to a maximum of 500 square feet (sf) of living space confined entirely within an existing single-family structure."
- Status: On January 21, 2020 the City Council extended an Urgency Ordinance governing ADUs through December 2020. This Ordinance fulfilled a state mandate that all cities adopt uniform provisions to regulate ADUs, as part of a state initiative to increase housing production in a variety of means. Among other provisions, the adoption of the state-mandated regulations require jurisdictions to ministerially allow Junior ADUs within existing or proposed single family dwelling, as requested by the referral.

  The City Council will consider permanent ADU regulations, consistent with State law, later in 2020, following Planning Commission review and a public input process that will include provisions for Junior ADUs that meet the goals of this referral.

Create Citywide Green Development standards by extending requirements of Downtown Plan throughout rest of Berkeley:

- Original referral date: April 26, 2016 (see Attachment 6)
- Sponsor: then-Councilmember Jesse Arreguin
- Referred to: City Manager (Planning Department), Energy Commission, and Community Environmental Advisory Commission
- Goal: Require LEED Gold or higher green building ratings, revise parking requirements to encourage ride-shares, bicycle parking, and alternative transportation benefits for residents.
- Status: The adoption of the new state Building Code, effective January 2020, included groundbreaking state provisions and local amendments to require even higher green building standards than those contemplated in the 2016 referral. Some examples include new local Berkeley "Reach Codes" that now provide

pathways for construction that exceed the efficiency requirements of the state energy codes, appendices to allow alternative construction methods such as those using strawbale materials, and expanded solar photovoltaic requirements for both residential and nonresidential construction.

The parking reform portions of this referral, along with similar asks from the earlier "Green Affordable Housing" and other Council referrals, will come to Council for consideration in Spring 2020. Staff proposes to now close the referrals which largely pertain to construction, such as this one, and then to resolve the parking-related aspects of numerous referrals when the actions return to Council later in 2020.

Berkeley "Deep Green" Building Initiative:

- Original referral date: February 28, 2017 (see Attachment 7)
- Sponsor: Mayor Arreguin, Councilmember Hahn
- Referred to: City Manager (Planning Department), Energy Commission
- Goal: Develop program to support zero-net energy goal for existing and new buildings, and promote use of building materials and practices which are sustainably sources, less toxic, and more energy efficient
- Status: The adoption of the new state Building Code, effective January 2020, included groundbreaking state provisions and local amendments which strengthened the "CALGreen" mandatory state green building standards code. As described above, the new code adoption also included new local Berkeley "Reach Codes" to help exceed the efficiency requirements of the state energy codes, and provisions to allow alternative construction methods and expanded solar photovoltaic requirements for both residential and nonresidential construction.

  The portions of this referral which pertain to existing buildings are being addressed under other existing referrals, including incentivizing residential energy efficiency and electrification (from Energy Commission April 24, 2018), revising the City Transfer Tax to incentivize energy and water efficiency (CM Harrison, Nov. 27, 2018), and evaluation and possible revisions to the Building Energy Saving Ordinance (BESO), each of which are expected to generate new policies for Council consideration later in 2020.

Electric Vehicle Charging Infrastructure:

- Original referral date: June 13, 2017 (see Attachment 8)
- Sponsor: Councilmembers Bartlett, Harrison, Hahn, and Wengraf
- Referred to: City Manager (Planning Department), Energy Commission
- Goal: Develop ordinance to require that new buildings include certain numbers of parking spaces and charging stations devoted to electric vehicles

- Status: The expanded "CALGreen" mandatory building standards mentioned above included specific requirements for parking spaces and EV charging infrastructure. For example, new single family structures must include raceways and wiring to support a future Level 2 EV charger in at least one parking space per dwelling unit, new multifamily structures must have 20% of their spaces so wired, and 80% of their spaces equipped for connecting raceways. Non-residential buildings now have requirements that 10% of spaces have raceways and wiring to support future Level 2 EV chargers, and 40% of spaces be readied with connecting raceways. In short, the EV charging requirements for parking spaces envisioned in the June 2017 Council referral have effectively been met.

BACKGROUND

As of the end of 2019, the Planning Department is tracking 55 active long-term referrals for which the department is assigned primary responsibility. These include referrals to the Building and Safety Division, the Office of Energy and Sustainable Development, and in particular to the Land Use Planning Division, which staffs the Planning Commission. A significant amount of staff time is spent tracking the referrals and monitoring progress for the periodic reports requested by the City Manager's Office, through which updates are provided to the Council twice each year. The referrals highlighted in this report have been addressed through a combination of changes to State law and local action by the Council, Commissions, and staff. Further, reducing the number of referrals for which tracking and reporting is required frees up staff resources which can be assigned to the additional policy goals sought by the referral authors.

ENVIRONMENTAL SUSTAINABILITY

There are no environmental opportunities associated with the delivery of this informational report. Many of the referrals worked on by the Planning Department have the potential to improve sustainable practices by increasing housing, improved green building and development practices, and improving energy efficiency, among many other areas.

POSSIBLE FUTURE ACTION

Upcoming department responses to referrals which are expected for Council review and consideration in 2020 include:

- Parking policy reform for new development
- Environmental Impact Report (EIR) for the Southside area, toward the goal of enabling more student housing
- Zoning Ordinance amendments as part of the Zoning Ordinance Revision Project
- ADU Ordinance amendments
- Adeline Corridor Plan and associated EIR
- Recommendations from the Joint Subcommittee on Implementation of State Housing Law regarding objective density and development standards
- Cannabis equity program

- Additional Zoning Ordinance amendments for businesses
- Amendments to the Building Energy Savings Ordinance
- A “Pathway to Clean Energy” report and recommendations, focused on actionable strategies toward electrification in existing buildings

FISCAL IMPACTS OF POSSIBLE FUTURE ACTION
Staff will identify the fiscal impacts for each of the referral responses listed in the above section.

CONTACT PERSON
Timothy Burroughs, Director, Planning and Development Department, (510) 981-7437
Jim Bondi, Associate Management Analyst, (510) 981-7428

Attachments:
1. Toxic remediation referral, 5/1/2012; Planning Commission staff report and Planning Commission minutes, 9/4/2019
2. Permit streamlining referral, 1/19/2016
3. Ministerial approval referral, 12/5/2017
4. Waive mitigation/impact fees referral, 9/12/2017
5. Junior ADU referral, 5/2/2017
6. Citywide Green Development standards referral, 4/26/2016
7. Deep Green Building initiative referral, 2/28/17
8. Electric Vehicle Charging Infrastructure referral, 6/13/17

CITY COUNCIL

Darryl Moore
Councilmember District 2

CONSENT CALENDAR
May 1, 2012

To: Honorable Mayor and Members of the City Council

From: Councilmember Darryl Moore, District 2
Councilmember Gordon Wozniak, District 8

Subject: Amend the Zoning Code to Facilitate Toxic Remediation in Manufacturing Districts

RECOMMENDATION

Refer to the Planning Commission recommendations for amending the zoning code in order to facilitate toxic remediation in manufacturing districts and to develop a streamlined process that would allow for one application process, rather than separate application processes for the City's Planning Department and the Toxics Division.

BACKGROUND

The current process for toxic remediation in manufacturing districts that require the removal of a building, whether or not it is currently in use, is quite involved and convoluted. There may be some amendments that can be made to the zoning code to make the process much more efficient.

Currently, the City of Berkeley Municipal Code Section 23C contains the following language

23C.08.050 Demolitions of Buildings Used for Commercial, Manufacturing or Community, Institutional or Other Non-residential Uses

A. A main building used for non-residential purposes may be demolished subject to issuance of a Use Permit.
B. A demolition of an accessory building containing less than 300 square feet of floor area is permitted as of right; an accessory building containing 300 square feet or more of floor area may be demolished subject to an AUP.
C. Any application for a Use Permit or AUP to demolish a non-residential building or structure which is 40 or more years old shall be forwarded to the Landmarks Preservation Commission (LPC) for review prior to consideration of the Use Permit or AUP. The LPC may initiate a landmark or structure-of-merit designation or may choose solely to forward to the Board its comments on the application. The Board shall consider the recommendations of the LPC in considering its action on the application.
D. A Use Permit or an AUP for demolition of a non-residential building or structure may be approved only if the Board or Zoning Officer finds that the demolition will not be

materially detrimental to the commercial needs and public interest of any affected neighborhood or the City, and one of the following findings that the demolition:

1. Is required to allow a proposed new building or other proposed new Use;
2. Will remove a building which is unusable for activities which are compatible with the purposes of the District in which it is located or which is infeasible to modify for such uses;
3. Will remove a structure which represents an unabatable attractive nuisance to the public; or
4. Is required for the furtherance of specific plans or projects sponsored by the City or other local district or authority. In such cases, it shall be demonstrated that it is infeasible to obtain prior or concurrent approval for the new construction or new use which is contemplated by such specific plans or projects and that adhering to such a requirement would threaten the viability of the plan or project. (Ord. 6478-NS § 4 (part), 1999)

This means that prior to any demolition, the project must be granted a Use Permit or an AUP, requiring findings, none of which include toxic remediation under a building.

Additionally, Chapter 23E.80.909 Paragraph D states that

D. Except as permitted under 23E.80.045, subdivisions A.1 or A.2, in order to approve a Use Permit under Section 23E.80.045 to change the use of or remove more than 25% of the floor area of a building currently or most recently used for manufacturing, wholesale trade or warehousing, the Zoning Officer or Board must find:
   1. Any necessary Use Permits that have been approved to provide comparable quality replacement manufacturing, wholesale trade and/or warehousing space in Berkeley at a comparable rent and that such replacement space will be available before the demolition or change of use of the space; or
   2. As a result of lawful business and building activities, there are exceptional physical circumstances (exclusive of the presence of hazardous materials in the building(s), soil or groundwater) found at the building not generally found in industrial buildings in the District which make it financially infeasible to reuse the building for any of the range of manufacturing, wholesale trade or warehouse uses permitted in the District. The analysis of the financial feasibility effects (which shall be verified by the City) of these physical circumstances shall consider those costs necessary to make the building meet current minimum standards for manufacturing, wholesale trade or warehouse buildings; and
   3. Appropriate mitigation has been made for loss of the manufacturing, warehousing or wholesale trade space in excess of 25% of that space through providing such space elsewhere in the City, payment into the West Berkeley Building Acquisition Fund, or by other appropriate means.

This requires findings that allow the removal of a building where there are “exceptional physical circumstances,” but is specifically exclusive of “presence of hazardous materials in the building(s), soil, or groundwater.”

In order to make the cleanup of a site with toxic soil, it is recommended that a provision number 5 be added to Chapter 23C.08.050 Paragraph D stating “It is required to allow the remediation of toxic soil in conformance with DTSC Clean-up Requirements and a City of Berkeley approved toxic clean-up and monitoring program.”

In addition, Chapter 23E.80.090 Findings should be amended to include a new finding number 4 stating that: “As a result of previous building activities there are hazardous materials that are required to be remediated and monitored which could not otherwise be fully characterized, remediated or monitored without demolition of the building(s)”

FISCAL IMPACTS OF RECOMMENDATION
Unknown

CONTACT PERSON

Councilmember Darryl Moore, District 2	981-7120
Councilmember Gordon Wozniak, District 8	981-7180

Planning and Development Department
Land Use Planning Division

STAFF REPORT

DATE: September 4, 2019

TO: Members of the Planning Commission

FROM: Justin Horner, Associate Planner

SUBJECT: Referral to Facilitate Toxic Remediation

INTRODUCTION

On May 1, 2012, the City Council referred to staff recommended changes to the Zoning Ordinance to streamline the permitting process for the removal of buildings for the purposes of remediating hazardous materials conditions *(see Attachment 1: Toxic Remediation Referral)*. This report will introduce the referral and ask Planning Commission for feedback on a proposed approach.

BACKGROUND

Currently, the Zoning Ordinance controls for demolition of non-residential buildings in two Chapters: Berkeley Municipal Code (BMC) Chapter 23C.08 (Demolition and Dwelling Unit Controls) and BMC 23E.80 (MU-LI Mixed Use-Light Industrial District Provisions). Both Chapters require the Zoning Adjustments Board (ZAB) to make findings in order to issue a Use Permit or (Administrative Use Permit) AUP to demolish a non-residential building.[1] These findings are listed below:

- Under **BMC Section 23C.08.050** (Demolitions of Buildings for Commercial, Manufacturing or Community, Institutional and Non-Residential Uses), the ZAB must find that the demolition of a non-residential building or structure:

  1. Is required to allow a proposed new building or other proposed new Use;

  2. Will remove a building which is unusable for activities which are compatible with the purposes of the District;

  3. Will remove a structure which represents an unabatable attractive nuisance to the public; or

[1] BMC 23C.08.050 (Demolitions of Buildings for Commercial, Manufacturing or Community, Institutional and Non-Residential Uses). BMC 23E.80.090 (Required Findings for Demolition in MU-LI District)

4. Is required for the furtherance of specific plans or projects sponsored by the City or other local district or authority.

In the Mixed Use-Light Industrial (MU-LI) District, which is intended to preserve and expand light industrial and manufacturing uses, there are additional required findings for the demolition or change of use of buildings that are currently or most recently used for manufacturing, wholesale trade or warehousing.

- Under **BMC Section 23E.80.090** (Findings), the ZAB must find that:

  1. Any necessary Use Permits that have been approved to provide comparable quality replacement manufacturing, wholesale trade and/or warehousing space in Berkeley at a comparable rent and that such replacement space will be available before the demolition or change of use of the space; or

  2. As a result of lawful business and building activities, there are exceptional physical circumstances (exclusive of the presence of hazardous materials in the building(s), soil or groundwater) found at the building not generally found in industrial buildings in the District which make it financially infeasible to reuse the building for any of the range of manufacturing, wholesale trade or warehouse uses permitted in the District; and

  3. Appropriate mitigation has been made for loss of the manufacturing, warehousing or wholesale trade space in excess of 25% of that space through providing such space elsewhere in the City, payment into the West Berkeley Building Acquisition Fund, or by other appropriate means.

None of the currently available findings include toxic remediation under a building, even in cases where a property owner may have a City of Berkeley approved toxic clean-up and monitoring plan or an approved clean-up plan from the State of California's Department of Toxic Substance Control (DTSC). This referral from City Council suggests adding an additional finding to account for these circumstances.

This referral is listed in the Re-weighted Ranked Voting (RRV) list as a "started" referral.

DISCUSSION

Proposed Amendments

The proposed amendments are provided in Attachment 2 and are explained below:

BMC Chapter 23C.08 (Demolition and Dwelling Unit Controls)

- Under BMC Section 23C.08.050 (Demolitions of Buildings for Commercial, Manufacturing or Community, Institutional and Non-Residential Uses), one of four findings must be made to allow for demolition of a non-residential building. The proposed Zoning Ordinance amendments add a fifth finding that considers remediation of toxic soil:

23C.08.050 -- Demolitions of Buildings Used for Commercial, Manufacturing or Community, Institutional or Other Non-residential Uses

D. A Use Permit or an AUP for demolition of a non-residential building or structure may be approved only if the Board or Zoning Officer finds that the demolition will not be materially detrimental to the commercial needs and public interest of any affected neighborhood or the City, and one of the following findings that the demolition:

1. Is required to allow a proposed new building or other proposed new Use;

2. Will remove a building which is unusable for activities which are compatible with the purposes of the District in which it is located or which is infeasible to modify for such uses;

3. Will remove a structure which represents an unabatable attractive nuisance to the public; ~~or~~

4. Is required for the furtherance of specific plans or projects sponsored by the City or other local district or authority. In such cases, it shall be demonstrated that it is infeasible to obtain prior or concurrent approval for the new construction or new use which is contemplated by such specific plans or projects and that adhering to such a requirement would threaten the viability of the plan or project.; or

5. Is required to allow the remediation of toxic soil in conformance with Department of Toxic Substance Control (DTSC) clean-up requirements and a City of Berkeley toxic clean-up and monitoring program.

BMC Chapter 23E.80 (MU-LI Mixed Use-Light Industrial District Provisions).

- Under BMC Section 23E.80.090.D (Findings), the change of use or the removal of more than 25% of the floor area of a building used for manufacturing, wholesale trade or warehousing is allowed with a Use Permit if certain findings are made. The proposed amendments remove existing language from one finding that specifically excludes the consideration of hazardous materials conditions (see D.2). As requested in the referral, amendments add a finding that explicitly allows for demolition of a building for the purposes of remediation of hazardous materials (see D.3). Proposed amendments also clarify that appropriate mitigations are required if findings D.2 or D.3 are made.

BMC Section 23E.80.090 -- Findings

D. Except as permitted under 23E.80.045, subdivisions A.1 or A.2, in order to approve a Use Permit under Section 23E.80.045 to change the use of or remove more than 25% of the floor area of a building currently or most recently used for manufacturing, wholesale trade or warehousing, the Zoning Officer or Board must find:

1. Any necessary Use Permits that have been approved to provide comparable quality replacement manufacturing, wholesale trade and/or warehousing space in Berkeley at a comparable rent and that such replacement space will be available before the demolition or change of use of the space; or

2. As a result of lawful business and building activities, there are exceptional physical circumstances ~~(exclusive of the presence of hazardous materials in the building(s), soil or groundwater)~~ found at the building not generally found in industrial buildings in the District which make it financially infeasible to reuse the building for any of the range of manufacturing, wholesale trade or warehouse uses permitted in the District. The analysis of the financial feasibility effects

(which shall be verified by the City) of these physical circumstances shall consider those costs necessary to make the building meet current minimum standards for manufacturing, wholesale trade or warehouse buildings; ~~and~~ or

3 . As a result of previous building activities there are hazardous materials that are required to be remediated and monitored which could not otherwise be fully characterized, remediated or monitored without demolition or the building(s), and

~~3.~~4. In the case of subdivisions D.2 or D.3, the Zoning Officer or Board must also find a~~A~~ppropriate mitigation has been made for loss of the manufacturing, warehousing or wholesale trade space in excess of 25% of that space through providing such space elsewhere in the City, payment into the West Berkeley Building Acquisition Fund, or by other appropriate means.

West Berkeley Plan and General Plan Goals and Policies
The proposed amendments are consistent with the following General Plan and West Berkeley Plan Goals and Policies:

- General Plan Policy LU33(1): Implement the West Berkeley Plan to maintain the full range of land uses and economic activities including residences, manufacturing, services, retailing, and other activities in West Berkeley.
- West Berkeley Plan Environmental Quality, Goal 1, Policy 1.2: Coordinate environmental regulation, both within the City of Berkeley, and with County, regional, state and Federal agencies, to avoid duplicative and unnecessary efforts by regulators and businesses, while meeting environmental standards.
- West Berkeley Plan Environmental Quality, Goal 4, Policy 4.1: Increase contaminated site cleanup efforts.
- West Berkeley Plan Economic Development, Goal 1, Policy B: Implement the measures in the Land Use Element of the Plan which will streamline the permit process for manufacturers (consistent with other Plan goals such as the maintenance of environmental standards) and explore additional methods for streamlining the process.
- West Berkeley Plan Economic Development Goal 1, Policy D: Continually assess the impact of policies in other areas—such as taxes, impact mitigations, transportation planning, environmental quality, and others to assess how these policies affect the goal of retaining and attracting manufacturing, and how the goals which these policies are intended to achieve can best be harmonized with the manufacturing retention goal.

Landmarks Review and Preservation of Manufacturing and Other Protected Uses in MU-LI
The proposed amendments preserve the existing requirement that any application for a Use Permit or AUP to demolish a non-residential building or structure which is 40 or more years old be forwarded to the Landmarks Preservation Commission (LPC) for review prior to consideration of the Use Permit or AUP.

The proposed amendments maintain existing the requirements for additional findings in the MU-LI district pertaining to changing, removing or demolishing material recovery enterprises,

manufacturing, wholesale trading and warehousing.[2] These include limitations on what subsequent uses would be permitted in spaces that are currently existing manufacturing, material recovery enterprise, wholesale trade and/or warehousing spaces; the MU-LI Use Limitations included in BMC 23E.80.060; and the requirement to provide for the replacement of any lost manufacturing, wholesale trade or warehousing space, or provide a payment into the West Berkeley Building Acquisition or other appropriate means. Similarly, the proposed amendments preserve the requirements to replace any demolished or changed Protected Uses[3] in comparable spaces within the Berkeley.

The intent of the proposed amendments is to facilitate toxic remediation consistent with West Berkeley Plan goals of retaining manufacturing uses and encouraging their operation without interference from other use types.

Staff has determined that the proposed amendments would facilitate the clean-up of hazardous materials conditions in the City of Berkeley and shorten the entitlement process for the redevelopment of eligible properties. Planning Commission is asked to review and discuss the proposed approach.

NEXT STEPS

Staff requests Planning Commission review the referral request and the proposed amendments to the Zoning Ordinance. If appropriate, Planning Commission is asked to provide feedback and direct staff to return to the October 2, 2019 Planning Commission meeting to hold a public hearing to amend the Zoning Ordinance, pursuant to BMC Chapter 23A.20.030.

ATTACHMENTS

1. Amend the Zoning Code to Facilitate Toxic Remediation in Manufacturing Districts Referral – May 1, 2012
2. Proposed Zoning Ordinance Language Revisions (Chapters 23C.08.050 and 23E.80.090)

[2] BMC Section 23E.80.045 (Special Provisions: Changes of Use/Removal of Floor Area Used for Material Recovery Enterprise, Manufacturing, Wholesale Trade or Warehousing)

[3] BMC Section 23E.80.040A (Special Provision: Protected Uses) which include art/craft studios, art/craft galleries, child and family day care homes, fine arts performance, instruction and rehearsal studios, and theaters and stage performance uses.

CITY COUNCIL

Darryl Moore
Councilmember District 2

CONSENT CALENDAR
May 1, 2012

To: Honorable Mayor and Members of the City Council

From: Councilmember Darryl Moore, District 2
Councilmember Gordon Wozniak, District 8

Subject: Amend the Zoning Code to Facilitate Toxic Remediation in Manufacturing Districts

RECOMMENDATION

Refer to the Planning Commission recommendations for amending the zoning code in order to facilitate toxic remediation in manufacturing districts and to develop a streamlined process that would allow for one application process, rather than separate application processes for the City's Planning Department and the Toxics Division.

BACKGROUND

The current process for toxic remediation in manufacturing districts that require the removal of a building, whether or not it is currently in use, is quite involved and convoluted. There may be some amendments that can be made to the zoning code to make the process much more efficient.

Currently, the City of Berkeley Municipal Code Section 23C contains the following language

23C.08.050 Demolitions of Buildings Used for Commercial, Manufacturing or Community, Institutional or Other Non-residential Uses

A. A main building used for non-residential purposes may be demolished subject to issuance of a Use Permit.
B. A demolition of an accessory building containing less than 300 square feet of floor area is permitted as of right; an accessory building containing 300 square feet or more of floor area may be demolished subject to an AUP.
C. Any application for a Use Permit or AUP to demolish a non-residential building or structure which is 40 or more years old shall be forwarded to the Landmarks Preservation Commission (LPC) for review prior to consideration of the Use Permit or AUP. The LPC may initiate a landmark or structure-of-merit designation or may choose solely to forward to the Board its comments on the application. The Board shall consider the recommendations of the LPC in considering its action on the application.
D. A Use Permit or an AUP for demolition of a non-residential building or structure may be approved only if the Board or Zoning Officer finds that the demolition will not be

materially detrimental to the commercial needs and public interest of any affected neighborhood or the City, and one of the following findings that the demolition:

1. Is required to allow a proposed new building or other proposed new Use;
2. Will remove a building which is unusable for activities which are compatible with the purposes of the District in which it is located or which is infeasible to modify for such uses;
3. Will remove a structure which represents an unabatable attractive nuisance to the public; or
4. Is required for the furtherance of specific plans or projects sponsored by the City or other local district or authority. In such cases, it shall be demonstrated that it is infeasible to obtain prior or concurrent approval for the new construction or new use which is contemplated by such specific plans or projects and that adhering to such a requirement would threaten the viability of the plan or project. (Ord. 6478-NS § 4 (part), 1999)

This means that prior to any demolition, the project must be granted a Use Permit or an AUP, requiring findings, none of which include toxic remediation under a building.

Additionally, Chapter 23E.80.909 Paragraph D states that

D. Except as permitted under 23E.80.045, subdivisions A.1 or A.2, in order to approve a Use Permit under Section 23E.80.045 to change the use of or remove more than 25% of the floor area of a building currently or most recently used for manufacturing, wholesale trade or warehousing, the Zoning Officer or Board must find:
   1. Any necessary Use Permits that have been approved to provide comparable quality replacement manufacturing, wholesale trade and/or warehousing space in Berkeley at a comparable rent and that such replacement space will be available before the demolition or change of use of the space; or
   2. As a result of lawful business and building activities, there are exceptional physical circumstances (exclusive of the presence of hazardous materials in the building(s), soil or groundwater) found at the building not generally found in industrial buildings in the District which make it financially infeasible to reuse the building for any of the range of manufacturing, wholesale trade or warehouse uses permitted in the District. The analysis of the financial feasibility effects (which shall be verified by the City) of these physical circumstances shall consider those costs necessary to make the building meet current minimum standards for manufacturing, wholesale trade or warehouse buildings; and
   3. Appropriate mitigation has been made for loss of the manufacturing, warehousing or wholesale trade space in excess of 25% of that space through providing such space elsewhere in the City, payment into the West Berkeley Building Acquisition Fund, or by other appropriate means.

This requires findings that allow the removal of a building where there are “exceptional physical circumstances,” but is specifically exclusive of “presence of hazardous materials in the building(s), soil, or groundwater.”

In order to make the cleanup of a site with toxic soil, it is recommended that a provision number 5 be added to Chapter 23C.08.050 Paragraph D stating “It is required to allow the remediation of toxic soil in conformance with DTSC Clean-up Requirements and a City of Berkeley approved toxic clean-up and monitoring program.”

In addition, Chapter 23E.80.090 Findings should be amended to include a new finding number 4 stating that: “As a result of previous building activities there are hazardous materials that are required to be remediated and monitored which could not otherwise be fully characterized, remediated or monitored without demolition of the building(s)”

FISCAL IMPACTS OF RECOMMENDATION
Unknown

CONTACT PERSON

Councilmember Darryl Moore, District 2 981-7120
Councilmember Gordon Wozniak, District 8 981-7180

Chapter 23C.08
Demolition and Dwelling Unit Controls

23C.08.050 Demolitions of Buildings Used for Commercial, Manufacturing or Community, Institutional or Other Non-residential Uses

A. A main building used for non-residential purposes may be demolished subject to issuance of a Use Permit.

B. A demolition of an accessory building containing less than 300 square feet of floor area is permitted as of right; an accessory building containing 300 square feet or more of floor area may be demolished subject to an AUP.

C. Any application for a Use Permit or AUP to demolish a non-residential building or structure which is 40 or more years old shall be forwarded to the Landmarks Preservation Commission (LPC) for review prior to consideration of the Use Permit or AUP. The LPC may initiate a landmark or structure-of-merit designation or may choose solely to forward to the Board its comments on the application. The Board shall consider the recommendations of the LPC in considering its action on the application.

D. A Use Permit or an AUP for demolition of a non-residential building or structure may be approved only if the Board or Zoning Officer finds that the demolition will not be materially detrimental to the commercial needs and public interest of any affected neighborhood or the City, and one of the following findings that the demolition:

1. Is required to allow a proposed new building or other proposed new Use;

2. Will remove a building which is unusable for activities which are compatible with the purposes of the District in which it is located or which is infeasible to modify for such uses;

3. Will remove a structure which represents an unabatable attractive nuisance to the public; ~~or~~

4. Is required for the furtherance of specific plans or projects sponsored by the City or other local district or authority. In such cases, it shall be demonstrated that

it is infeasible to obtain prior or concurrent approval for the new construction or new use which is contemplated by such specific plans or projects and that adhering to such a requirement would threaten the viability of the plan or project~~.~~; or

5. Is required to allow the remediation of toxic soil in conformance with Department of Toxic Substance Control (DTSC) clean-up requirements and a City of Berkeley toxic clean-up and monitoring program.

Chapter 23E.80
MU-LI Mixed Use-Light Industrial District Provisions

23E.80.090 Findings

A. In order to approve any Use Permit under this chapter the Zoning Officer or Board must make the finding required by Section 23B.32.040. The Zoning Officer or Board must also make the findings required by the following paragraphs of this section to the extent applicable:

B. A proposed use or structure must:

1. Be consistent with the purposes of the District;

2. Be compatible with the surrounding uses and buildings;

3. Be consistent with the adopted West Berkeley Plan;

4. Be unlikely, under reasonably foreseeable circumstances, to either induce a substantial change of use in buildings in the District from manufacturing, wholesale trade or warehousing uses;

5. Be designed in such a manner to be supportive of the light industrial character of the district. Such physical compatibility shall include materials used; facade treatments; landscaping; lighting; type, size and placement of awnings, windows and signs; and all other externally visible aspects of the design of the building and

site. If the building and/or site is split between the MU-LI District and the West Berkeley Commercial District that there are clear and appropriate distinctions in all design aspects between the portions of the building and site within the MU-LI District and the portions within the West Berkeley Commercial District;

6. Be able to meet any applicable performance standards as described in Section 23E.80.070.D.

C. In order to approve a Use Permit under Section 23E.80.040, the Zoning Officer or Board must find that the space formerly occupied by the protected use has been replaced with a comparable space in the West Berkeley Plan area, which is reserved for use by any protected use in the same category:

1. For purposes of this section, such replacement space shall not qualify for exemption under Section 23E.80.040.I or by reason of having been established after July 6, 1989;

2. In considering whether a project will be detrimental, consideration shall be limited to the potential detriment associated with the new use and dislocation of any specific previous occupant or use shall not be a basis for finding detriment.

D. Except as permitted under 23E.80.045, subdivisions A.1 or A.2, in order to approve a Use Permit under Section 23E.80.045 to change the use of or remove more than 25% of the floor area of a building currently or most recently used for manufacturing, wholesale trade or warehousing, the Zoning Officer or Board must find:

1. Any necessary Use Permits that have been approved to provide comparable quality replacement manufacturing, wholesale trade and/or warehousing space in Berkeley at a comparable rent and that such replacement space will be available before the demolition or change of use of the space; or

2. As a result of lawful business and building activities, there are exceptional physical circumstances ~~(exclusive of the presence of hazardous materials in the building(s), soil or groundwater)~~ found at the building not generally found in industrial buildings in the District which make it financially infeasible to reuse the building for any of the range of manufacturing, wholesale trade or warehouse uses

permitted in the District. The analysis of the financial feasibility effects (which shall be verified by the City) of these physical circumstances shall consider those costs necessary to make the building meet current minimum standards for manufacturing, wholesale trade or warehouse buildings; ~~and~~ or

3. As a result of previous building activities there are hazardous materials that are required to be remediated and monitored which could not otherwise be fully characterized, remediated or monitored without demolition or the building(s), and

~~3~~ 4. In the case of subdivisions D.2 or D.3, the Zoning Officer or Board must also find a~~A~~ppropriate mitigation has been made for loss of the manufacturing, warehousing or wholesale trade space in excess of 25% of that space through providing such space elsewhere in the City, payment into the West Berkeley Building Acquisition Fund, or by other appropriate means.

E. In order to approve a Use Permit for division of space under Section 23E.80.050.D, the Zoning Officer or Board must find that the conversion would not create or contribute to a shortage of industrial spaces in West Berkeley for spaces of the size being converted and either:

1. The conversion can be reasonably expected to better serve the purposes of the District than leaving the space intact; or

2. The conversion would create spaces which could cross-subsidize larger industrial spaces.

F. In order to approve a Permit to establish or expand a Food Service Establishment, the Zoning Officer or Board must find that the establishment of the food service use, given its size, location, physical appearance and other relevant characteristics, will not have a significant detrimental impact on the industrial character of the area. In order to approve an Administrative Use Permit for a Food Service Establishment less than 5,000 square feet under Section 23E.80.030, the Zoning Officer must find that a substantial portion of the food consists of goods manufactured on site.

G. In order to approve a Use Permit to establish or modify a Live/Work Unit, the Zoning Officer or Board must make the findings required in Chapter 23E.20, as well as the following:

1. The applicants have made adequate provisions to insure that within the Live/Work Units, occupants of the Live/Work Units will only engage in the occupations listed in the definitions of Art/Craft Studios; and

2. Development of such Live/Work Units is not incompatible with adjacent and nearby industrial uses; and

3. The applicants have made adequate provisions to insure that occupant of each unit of the Live/Work space will be notified in writing that the unit is in the MU-LI District and that light manufacturing is the primary activity in the District, including a requirement that each occupant indicates that he or she has read and understood this information by means of a rider to a lease or a covenant to a deed, as appropriate.

H. In order to approve a Use Permit for the substitution of bicycle and/or motorcycle parking under Section 23E.80.080.E, the Zoning Officer or Board must find that the substitution will not lead to an undue shortage of automobile parking spaces and that it can be reasonably expected that there will be demand for the bicycle and/or motorcycle parking spaces.

I. In order to approve a Permit for the establishment or expansion of a child care center, or recreational or educational facility to be used by children, the Zoning Officer or Board must make all of the following findings:

1. Development of the school, child care center, large family day care or recreational facility to be used by children is not, in the particular circumstances of the project, incompatible with adjacent and nearby uses, including industrial uses;

2. An appropriate risk analysis or risk assessment, as defined by the City, has been made and has shown that there is not significant risk to children in the use from other activities near the site;

3. The applicants have made adequate provisions to ensure that all parents of students or children in the school, child care center, large family day care or recreational facility to be used by children will be notified in writing (on a form approved by the City) that the school is in the West Berkeley Plan MU-LI District, and that light manufacturing is a permitted activity in the District and that Primary Production Manufacturing or Construction Products Manufacturing may be permitted uses in adjacent districts, including a requirement that each parent will indicate that they have read and understood this information by means of a written statement returned to the school or child care center and available for review.

Planning Commission

FINAL MINUTES OF THE REGULAR PLANNING COMMISSION MEETING
September 4, 2019

The meeting was called to order at 7:07 p.m.

Location: South Berkeley Senior Center, Berkeley, CA

1. **ROLL CALL:**
   Commissioners Present: Benjamin Beach, Mary Kay Lacey, Steve Martinot, Christine Schildt, Jeff Vincent, Brad Wiblin and Rob Wrenn.

   Commissioners Absent: Benjamin Fong (absent) and Rob Kapla (leave of absence).

   Staff Present: Secretary Alene Pearson, Katrina Lapira, Beth Greene, and Justin Horner.

2. **ORDER OF AGENDA:** No changes.

3. **PUBLIC COMMENT PERIOD:** No speakers.

4. **PLANNING STAFF REPORT:**
   Staff provided the following updates on upcoming meetings and policy projects

- Sept 10 –City Council: Southside EIR contract to be presented
- Sept 16 –ZORP: Discussion of residential district chapters
- September 24- City Council: Planning Commission Workplan
- Sept 25- JSISHL: Objective standards- focus on density standards
- Student Housing: EIR to study modifications of development standards and Southside Car-free Overlay folded into Parking Reform
- Parking Reform: Parking study to begin in Sept/Oct to inform modifications to off-street parking requirements. TDM proposal will be shared with PC in Oct.
- Objective Standards: with JSISHL
- Affordable Housing: research and analysis of streamlining referrals and ground floor uses underway.

Information Items: None.

Communication:

- None.

Late Communications (Received after the Packet deadline):

- 2019-09-03 Pappas- Public Comment (Cannabis Delivery-Only)

Late Communications (Received and distributed at the meeting):

- 2019-09-04 Taplin- Public Comment (Cannabis Delivery-Only)

5. CHAIR REPORT: None.

6. COMMITTEE REPORT:

- Adeline Subcommittee: Recap of three previous meetings where the subcommittee reviewed chapters of the draft plan and provided feedback to planning staff. Planning staff is currently reviewing and responding to comments provided by the public on the Draft EIR. No Subcommittee meetings are currently scheduled for September.
- Joint Subcommittee for Implementation of State Housing Laws (JSISHL): Shall meet on September 25 to discuss density standards.
- Zoning Ordinance Revision Project (ZORP): Upcoming meeting on September 16
- PC's Cannabis Recommendations to Council: Commissioner Lacey will provide a letter to the City Council concerning the Planning Commission's recommendations on comprehensive cannabis made at the meeting on July 17, 2019. Deadline to submit letter is on October 11, 2019.

7. APPROVAL OF MINUTES:

Motion/Second/Carried (Martinot/Lacey) to approve the Planning Commission Meeting Minutes from July 17, 2019 with discussed amendments. Ayes: Beach, Lacey, Martinot, Schildt, and Wiblin. Noes: None. Abstain: Jeff Vincent, Rob Wrenn. Absent: Fong and Kapla. (5-0-2-2)

FUTURE AGENDA ITEMS AND OTHER PLANNING-RELATED EVENTS: At the next meeting, October 2, 2019 the following items may be presented.

- Local Hazard Mitigation Plan Public Hearing
- Toxic Remediation Referral Public Hearing
- Ground floor referrals

Events + More:

- September 12, 2019 (6pm)- Urban Habitat's 30th Anniversary Celebration at the Oakland Museum
- Urban Habitat- Boards and Commissions Leadership Institute- application period through Sunday, October 20, 2019.
- Turner Center of Housing Innovation Paper- *Demystifying Development Math*

AGENDA ITEMS

9. Action: **Public Hearing: Zoning Ordinance Amendments for Cannabis Uses: Delivery-Only Retailers**

Planning Commission held a public hearing to discuss Zoning Ordinance amendments for cannabis delivery services. Planning Commission considered proposed amendments to establish new land use regulations for cannabis retail delivery services (Delivery-Only Retailers). Planning Commission also considered vertically integrated cannabis businesses

(Microbusinesses) that involve Delivery-Only Retail in their recommendation. The Commission discussed the presence of existing similar delivery-only services in Berkeley and the appropriate number, locations (within a building and allowable zoning districts), discretion and criteria for Delivery-Only Retailers.

Public Comments: 5

Motion/Second/Carried (Schildt/Wrenn) to recommend that the City Council adopt the staff proposed language, as amended, which includes the following provisions, in Section 23C.25.010 Cannabis Retail:

-Delivery-Only Retailers are subject to approval through the selection process set forth in Section 12.22.020.
-Delivery-Only Retailers are permitted with a Zoning Certificate in the M District and C-prefixed districts other than the C-N District.
-Delivery-Only Retailers may not be located within 300 feet of any School or City-operated community center or skate park.
-Delivery-Only Retailers may not be located on the street fronting portion of the ground floor in a C-prefixed district.
-Implement a city-wide quota of 10 Delivery-Only Retailers, where at least half are equity candidates.
- All delivery-only retailers shall be permitted with a Zoning Certificate in all allowable zoning districts.
- Delivery-Only Retailers in the M District shall be evaluated and regulated for Zoning purposes in the same way as Warehouse-Based Non-Store Retailers, and shall be subject to the same numeric and buffer requirements as Delivery-Only Retailers in C-prefixed districts.

Ayes: Beach, Lacey, Martinot, Schildt, and Wrenn. Noes: Vincent and Wiblin. Abstain: None. Absent: Fong and Kapla. (5-2-0-2)

Motion/Second/Carried (Beach /Wrenn) to close the public hearing at 9:32pm.
Ayes: Beach, Lacey, Martinot, Schildt, Vincent, Wiblin, and Wrenn. Noes: None. Abstain: None. Absent: Fong and Kapla. (7-0-0-2)

10. Action: Public Hearing: Tentative Tract Map #8790- 739 Channing Way

Staff presented the Tentative Tract Map application of an entitled multi-unit development located at 739 Channing Way in the West Berkeley Plan Area. The Planning Commission opened the public hearing at 9:46pm. The Commission asked clarifying questions about the applicability of the Affordable Housing Mitigation Fee and the Inclusionary Housing Ordinance, and the general process associated with approving a Tentative Tract Map.

Public Comments: 1

Motion /Second/Carried (Schildt /Lacey) to approve Tentative Tract Map #8490 subject to Conditions, with an amendment to the Tentative Tract Map Finding 2A1 and a correction Finding 2E.

Ayes: Beach, Lacey, Schildt, Vincent, Wiblin, and Wrenn. Noes: Martinot. Abstain: None. Absent: Fong and Kapla. (6-1-0-2)

Motion/Second/Carried (Schildt/Beach) to close the public hearing at 10:19pm. Ayes: Beach, Lacey, Martinot, Schildt, Vincent, Wiblin, and Wrenn. Noes: Abstain: None. Absent: Fong and Kapla. (7-0-0-2)

11. Discussion: Referral to Facilitate Toxic Remediation

Staff shared the City Council referral made on May 1, 2012, recommending changes to the Zoning Ordinance to streamline the permitting process for the removal of buildings to remediate hazardous materials conditions. Staff presented their recommended code amendments and asked for additional feedback and direction. The Planning Commission discussed the history related to the referral, aspects of the proposed amendments, and questioned its importance in light of other referrals related to addressing the issue of housing.

Public Comments: 3

Motion/Second/Carried (Schlidt/Vincent) to direct staff to prepare a report to close-out the referral considering that the conditions in which the referral was made are no longer relevant. Ayes: Beach, Lacey, Schildt, Vincent, Wiblin, and Wrenn. Noes: Martinot. Abstain: None. Absent: Fong and Kapla. (6-1-0-2)

The meeting was adjourned at 11:08pm
Commissioners in attendance: 7 of 9
Members in the public in attendance: 6
Public Speakers: 6 speakers
Length of the meeting: 3 hours and 59 minutes

Alene Pearson
Planning Commission Secretary

10/4/19
Date

Kriss Worthington

Councilmember, City of Berkeley, District 7
2180 Milvia Street, 5th Floor, Berkeley, CA 94704
PHONE 510-981-7170, FAX 510-981-7177, EMAIL
kworthington@ci.berkeley.ca.us

ACTION CALENDAR
January 19, 2016

To: Honorable Mayor and Members of the City Council
From: Councilmember Kriss Worthington

Subject: City Manager Referral: Streamline the Permit Process for Housing Projects with a Majority or More Affordable Units

RECOMMENDATION

Refer to City Manager to create an ordinance that will streamline the permit process for housing projects with a majority or more affordable units if it includes at least 20 percent of units at 50% AMI, after consideration of Austin and Santa Fe policies and policies proposed in San Francisco

BACKGROUND

Berkeley is at a crossroads. Housing costs are at an all-time high and the displacement of communities of color continues at an alarming rate.

The City must utilize all of its tools to cut red tape and facilitate the development of desperately needed affordable housing units for low-income and middle-class families. A very important and simple tool that Council can use is to create an ordinance to simplify the establishment process of housing projects with a majority or more affordable units. This simple action would reduce the administrative burden on developers seeking to build affordable housing in Berkeley. San Francisco recently introduced a similar proposal.

Austin, Texas has streamlined through a Safe, Mixed Income, Affordable, Reasonably priced, and Transit Oriented policy. Santa Fe has accelerated the permit process for projects that include at least 25 percent affordable housing. San Francisco Supervisor s are considering legislation for certain affordable housing projects to not require conditional use permits. This proposal is intended to reduce the amount of time and money spent on acquiring various conditional use authorizations in San Francisco. The San Francisco Ordinance would amend the Planning Code to permit affordable housing as a principal use in the public zoning district and not requiring a conditional use permit for affordable housing in other zoning districts, except in RH (Residential, House) zoning districts and on designated public open space or property under the jurisdiction of the Recreation and Park Department. For more information: http://tinyurl.com/ReduceRedTape

FINANCIAL IMPLICATIONS:
Minimal.

ENVIRONMENTAL SUSTAINABILITY:
Consistent with Berkeley's Environmental Sustainability Goals and no negative impact.

CONTACT PERSON:
Councilmember Kriss Worthington 510-981-7170

Lori Droste
Berkeley City Council, District 8

ACTION CALENDAR
November 28, 2017

To:	Honorable Mayor and Members of the City Council
From:	Councilmember Lori Droste, Councilmember Ben Bartlett, Mayor Jesse Arreguin and Councilmember Kriss Worthington
Subject:	Ministerial Approval of Zoning-Compliant Affordable Housing

RECOMMENDATION

Refer to the Planning Commission and City Manager to amend the zoning ordinance by July of 2018 to allow ministerial zoning approval of:

- Housing projects that receive Housing Trust Fund monies and/or
- Housing projects that have more than 50% below market rate (BMR) units with 20% of the BMR units designated for those earning up to 50% AMI (extremely low and very low income earners).

Design review will be conducted by staff for the aforementioned projects.

FINANCIAL IMPLICATIONS

Staff time and the potential costs associated with any necessary consultants.

BACKGROUND

Berkeley City Council has repeatedly emphasized the need for affordable housing. Many important initiatives have passed many items to address the obstacles embedded in the development review ***process***.[1] However, none of the previous proposals explicitly mandate

[1] Droste 10/27/15 “Green Affordable Housing Package–Policy #2”, Worthington 1/19/16 “Streamline the Permit Process for Housing Projects with a Majority or More Affordable Units, Hahn, Davila, Bartlett and Harrison 9/12/17 “Expedited Review for Affordable Housing.” (Partial list of legislation).

ministerial approval of affordable housing, which would have the biggest impact on streamlining the lengthy entitlement process for affordable housing.

If Council approves this recommendation, it will be easier and faster to create affordable housing in Berkeley since the project review process can take significant time. Like most cities across California, Berkeley struggles to create enough below market rate units. In particular, the City has not produced its fair share of the goals set by the Association of Bay Area Government's Regional Housing Needs Allocation for below market units (City of Berkeley's Biannual Housing Pipeline Report, 2017). The City of Berkeley has met 0% of its goals for extremely low income (0-30% AMI) and moderate income (81%-120% AMI) housing. Berkeley has only met 34% of its regional obligation for very low income housing (31-50% AMI) and 15% of its low-income housing goals (51% AMI to 80% AMI). The City of Berkeley needs to make it much easier to create those units. Although many factors influence the construction of affordable housing, easing the discretionary review process for affordable housing is the strongest act a local municipality can take to help facilitate the creation of affordable housing.

According to the nonpartisan Legislative Analyst's Office, "researchers have linked additional review time to higher housing costs. A study of jurisdictions in the Bay Area found that each layer of independent review was associated with a 4% increase in a jurisdiction's home prices (California's High Housing Costs: Causes and Consequences, 2015)." Excessive regulation also lowers the elasticity of new housing supply by increasing delays in the permit process (Paciorek, 2013). UC Berkeley Professor Enrico Moretti also has written extensively about how burdensome land use regulations contribute to high housing costs and worsening environmental conditions (Hsieh and Moretti, 2015). Rising rents are the main culprit in the Bay Area's exploding homeless population. Reducing barriers to construction can have large effects on homelessness (PPIC, 2001). President Barack Obama's own *Housing Development Toolkit* advocates for significantly more ministerial approval processes to address housing affordability throughout the United States (2016).

This particular type of streamlining is neither new nor out of the ordinary. In 1969, the State of Massachusetts passed "The Massachusetts Comprehensive Permit Act," which streamlined the affordable housing entitlement process significantly. Consequently, the majority of municipalities in Massachusetts have created affordable housing in their communities.

ENVIRONMENTAL SUSTAINABILITY

This recommendation is consistent with Berkeley's environmental sustainability goals. Transportation emissions are the predominant source of California's greenhouse gas emissions. By building affordable housing in areas well-served by transit, the City of Berkeley can positively impact the environment by reducing commute times and disincentivizing urban sprawl.

CONTACT PERSON

Councilmember Lori Droste
Council District 8 (510) 981-7180

Lori Droste
Berkeley City Council, District 8

ACTION CALENDAR
November 28, 2017

To: Honorable Mayor and Members of the City Council
From: Councilmember Lori Droste, Councilmember Ben Bartlett, Mayor Jesse Arreguin, and Councilmember Kriss Worthington
Subject: Ministerial Approval of Zoning-Compliant Affordable Housing

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- Housing projects that have more than 50% below market rate (BMR) units with 20% of the BMR units designated for those earning up to 50% AMI (extremely low and very low income earners).

~~with~~

Design review will be conducted by staff for the aforementioned projects. ~~"Affordable housing" should be defined as a project provided by one of the region's nonprofit affordable housing developers (SAHA, Bridge, RCD, etc.).~~

FINANCIAL IMPLICATIONS

Staff time and the potential costs associated with any necessary consultants.

BACKGROUND

Berkeley City Council has repeatedly emphasized the need for affordable housing. Many important initiatives have passed many items to address the obstacles embedded in the development review ***process***.[2] However, none of the previous proposals explicitly mandate ministerial approval of affordable housing, which would have the biggest impact on streamlining the lengthy entitlement process for affordable housing.

[2] Droste 10/27/15 "Green Affordable Housing Package–Policy #2", Worthington 1/19/16 "Streamline the Permit Process for Housing Projects with a Majority or More Affordable Units, Hahn, Davila, Bartlett and Harrison 9/12/17 "Expedited Review for Affordable Housing." (Partial list of legislation).

If Council approves this recommendation, it will be easier and faster to create affordable housing in Berkeley since the project review process can take significant time. Like most cities across California, Berkeley struggles to create enough below market rate units. In particular, the City has not produced its fair share of the goals set by the Association of Bay Area Government's Regional Housing Needs Allocation for below market units (City of Berkeley's Biannual Housing Pipeline Report, 2017). The City of Berkeley has met 0% of its goals for extremely low income (0-30% AMI) and moderate income (81%-120% AMI) housing. Berkeley has only met 34% of its regional obligation for very low income housing (31-50% AMI) and 15% of its low-income housing goals (51% AMI to 80% AMI). The City of Berkeley needs to make it much easier to create those units. Although many factors influence the construction of affordable housing, easing the discretionary review process for affordable housing is the strongest act a local municipality can take to help facilitate the creation of affordable housing.

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This particular type of streamlining is neither new nor out of the ordinary. In 1969, the State of Massachusetts passed "The Massachusetts Comprehensive Permit Act," which streamlined the affordable housing entitlement process significantly. Consequently, the majority of municipalities in Massachusetts have created affordable housing in their communities.

ENVIRONMENTAL SUSTAINABILITY

This recommendation is consistent with Berkeley's environmental sustainability goals. Transportation emissions are the predominant source of California's greenhouse gas emissions. By building affordable housing in areas well-served by transit, the City of Berkeley can positively impact the environment by reducing commute times and disincentivizing urban sprawl.

CONTACT PERSON

Councilmember Lori Droste
Council District 8 (510) 981-7180

Kate Harrison
Councilmember District 4

REVISED
AGENDA MATERIAL

Meeting Date: **November 28, 2017**

Item Number: **26**

Item Description: **Ministerial Approval of Zoning-Compliant Affordable Housing**

Submitted by: **Councilmembers Kate Harrison and Sophie Hahn**

Additions submitted as friendly amendments to clarify the many barriers addressed by the package of State Legislature housing bills passed in 2017. We are referring to staff to evaluate the impact of these housing related bills on the City's zoning and permitting process and ways to expedite that process.

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E-Mail: *kharrison@CityofBerkeley.info*

Kate Harrison
Councilmember District 4

ACTION CALENDAR
November 28, 2017

To: Honorable Mayor and Members of the City Council

From: Councilmembers Lori Droste and Ben Bartlett

Subject: Ministerial Approval of Zoning-Compliant Affordable Housing

RECOMMENDATION

Refer to the City Manager to analyze changes to state housing provisions in the 2017 California Legislative Session for their impact on the City's practices for planning and approving affordable housing, and recommend possible ~~amendments~~ changes, if any, to the zoning ordinance or permitting process to ensure compliance with state law and ~~allow ministerial~~ support expedited approval of ~~zoning-compliant~~ affordable housing ~~with design review conducted by staff~~, consistent with these new laws. "Affordable housing" should be defined as a project receiving Affordable Housing Trust Fund Money, ~~providing housing affordable to households at below 60% Area Median Income,~~ such as that provided by one of the region's nonprofit affordable housing developers (SAHA, Bridge, RCD, etc.).

FINANCIAL IMPLICATIONS

Staff time and the potential costs associated with any necessary consultants.

BACKGROUND

It is incumbent on the City to make it~~If Council approves this recommendation, it will be~~ easier and faster to ~~create~~ build affordable housing in Berkeley~~. since the project review process can take significant time.~~ The project review process imposes a significant burden on applicants, both in terms of time taken and financial cost, and is a major barrier to the construction of affordable housing. Like most cities across California, Berkeley struggles to create enough below market rate units. In particular, the City has not produced its fair share of the goals set by the Association of Bay Area Government's Regional Housing Needs Allocation (RHNA) for below market units. This is borne out by the results of the Bi-Annual Housing Pipeline Report, which is also before this Council. It shows that while the City has already met over 90% of its Above Market Rate Housing need as set forth in the City's ~~by the Association of Bay Area Governments in our Regional Housing Needs Allocation (~~RHNA~~)~~ goals, it is falling behind in terms of Below Market Rate Units. The City of Berkeley needs to make it much easier to create those units.

A package of 15 housing related bills that passed in the 2017 Session of the State Legislature may have significant impact on the City's process for planning and

approving housing projects. A summary analysis by the independent legal firm Goldfarb and Lipman, Attorneys (Attachment 1) indicates that the package may, among other impacts, shorten the timeline for project approval to 90 days, require that all development standards be objective, create a process for zoning by right for some developments, change the standard of evidence for rejecting a proposed development, eliminate parking requirements for affordable developments, and increase the City's housing development reporting requirement to the State.

These new State laws could result in a massive shift to what is required of the City in the sphere of housing planning and development. This item asks the City Manager to analyze these changes to determine their precise impact on the city of Berkeley and, based on the findings of such an analysis, make recommendations to the Council of possible changes to the City's affordable housing approval process to 1) ensure compliance with new State requirements and 2) reduce administrative barriers to the construction of Below Market Rate Housing.

According to the nonpartisan Legislative Analyst's Office, "researchers have linked additional review time to higher housing costs. A study of jurisdictions in the Bay Area found that each layer of independent review was associated with a 4% increase in a jurisdiction's home prices (California's High Housing Costs: Causes and Consequences, 2015)." Excessive regulation also lowers the elasticity of new housing supply by increasing delays in the permit process (Paciorek, 2013). UC Berkeley Professor Enrico Moretti also has written extensively about how burdensome land use regulations contribute to high housing costs and worsening environmental conditions. Rising rents are the main culprit in the Bay Area's exploding homeless population. Reducing barriers to construction can have large effects on homelessness (PPIC, 2001).

ENVIRONMENTAL SUSTAINABILITY

This recommendation is consistent with Berkeley's environmental sustainability goals. Transportation emissions are the predominant source of California's greenhouse gas emissions. By building affordable housing in areas well-served by transit, the City of Berkeley can positively impact the environment by reducing commute times and disincentivizing urban sprawl.

CONTACT PERSON

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Kriss Worthington

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AMENDMENT
ACTION CALENDAR
November 28, 2017

To: Honorable Mayor and Members of the City Council
From: Councilmember Kriss Worthington

Subject: Amendment to Add Prior Council Referral to "Ministerial Approval of Zoning-Compliant Affordable Housing" Council Item

RECOMMENDATION:
To once again refer the prior referral from 2016 as an amendment to the "Ministerial Approval of Zoning-Compliant Affordable Housing" Council Item by Councilmember Droste to facilitate a larger number of affordable units moving forward. This Council Item was passed on January 19, 2016 and was referred to the City Manager. This is meant to be an addition to this item, not replace it.

This item would allow a larger number of affordable units to move forward more expeditiously, and we are proposing that both of these move forward together.

BACKGROUND:
See attached.

FINANCIAL IMPLICATIONS: Minimal.

ENVIRONMENTAL SUSTAINABILITY:
Consistent with Berkeley's Environmental Sustainability Goals and no negative impact.

CONTACT PERSON:
Councilmember Kriss Worthington 510-981-7170

Kriss Worthington

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ACTION CALENDAR
January 19, 2016

To: Honorable Mayor and Members of the City Council
From: Councilmember Kriss Worthington

Subject: City Manager Referral: Streamline the Permit Process for Housing Projects with a Majority or More Affordable Units

RECOMMENDATION

Refer to City Manager to create an ordinance that will streamline the permit process for housing projects with a majority or more affordable units if it includes at least 20 percent of units at 50% AMI, after consideration of Austin and Santa Fe policies and policies proposed in San Francisco

BACKGROUND

Berkeley is at a crossroads. Housing costs are at an all-time high and the displacement of communities of color continues at an alarming rate.

The City must utilize all of its tools to cut red tape and facilitate the development of desperately needed affordable housing units for low-income and middle-class families. A very important and simple tool that Council can use is to create an ordinance to simplify the establishment process of housing projects with a majority or more affordable units. This simple action would reduce the administrative burden on developers seeking to build affordable housing in Berkeley. San Francisco recently introduced a similar proposal.

Austin, Texas has streamlined through a Safe, Mixed Income, Affordable, Reasonably priced, and Transit Oriented policy. Santa Fe has accelerated the permit process for projects that include at least 25 percent affordable housing. San Francisco Supervisor s are considering legislation for certain affordable housing projects to not require conditional use permits. This proposal is intended to reduce the amount of time and money spent on acquiring various conditional use authorizations in San Francisco. The San Francisco Ordinance would amend the Planning Code to permit affordable housing as a principal use in the public zoning district and not requiring a conditional use permit for affordable housing in other zoning districts, except in RH (Residential, House) zoning districts and on designated public open space or property under the jurisdiction of the Recreation and Park Department. For more information: http://tinyurl.com/ReduceRedTape

FINANCIAL IMPLICATIONS:

Minimal.

ENVIRONMENTAL SUSTAINABILITY:
Consistent with Berkeley's Environmental Sustainability Goals and no negative impact.

CONTACT PERSON:
Councilmember Kriss Worthington 510-981-7170

Lori Droste
Berkeley City Council, District 8

ACTION CALENDAR
December 5, 2017
(Continued from November 28, 2017)

To: Honorable Mayor and Members of the City Council

From: Councilmembers Lori Droste and Ben Bartlett

Subject: Ministerial Approval of Zoning-Compliant Affordable Housing

RECOMMENDATION

Refer to the City Manager to amend the zoning ordinance to allow ministerial approval of zoning-compliant affordable housing with design review conducted by staff. "Affordable housing" should be defined as a project provided by one of the region's nonprofit affordable housing developers (SAHA, Bridge, RCD, etc.).

FINANCIAL IMPLICATIONS

Staff time and the potential costs associated with any necessary consultants.

BACKGROUND

If Council approves this recommendation, it will be easier and faster to create affordable housing in Berkeley since the project review process can take significant time. Like most cities across California, Berkeley struggles to create enough below market rate units. In particular, the City has not produced its fair share of the goals set by the Association of Bay Area Government's Regional Housing Needs Allocation for below market units. The City of Berkeley needs to make it much easier to create those units.

According to the nonpartisan Legislative Analyst's Office, "researchers have linked additional review time to higher housing costs. A study of jurisdictions in the Bay Area found that each layer of independent review was associated with a 4% increase in a jurisdiction's home prices (California's High Housing Costs: Causes and Consequences, 2015)." Excessive regulation also lowers the elasticity of new housing supply by increasing delays in the permit process (Paciorek, 2013). UC Berkeley Professor Enrico Moretti also has written extensively about how burdensome land use regulations contribute to high housing costs and worsening environmental conditions. Rising rents are the main culprit in the Bay Area's exploding homeless population. Reducing barriers to construction can have large effects on homelessness (PPIC, 2001).

ENVIRONMENTAL SUSTAINABILITY

This recommendation is consistent with Berkeley's environmental sustainability goals. Transportation emissions are the predominant source of California's greenhouse gas emissions. By building affordable housing in areas well-served by transit, the City of Berkeley can positively impact the environment by reducing commute times and disincentivizing urban sprawl.

CONTACT PERSON

Councilmember Lori Droste, Council District 8, (510) 981-7180

Sophie Hahn
Councilmember District 5

REVISED
AGENDA MATERIAL

Meeting Date: **July 25, 2017**

Item Number: **41**

Item Description: **Referral to the Housing Advisory Commission Consideration of an Ordinance to Establish a Waiver of Administrative and Permit Fees for Certain Affordable Housing Projects**

Submitted by: **Councilmember Sophie Hahn**

Adding Mayor Arreguín as a co-sponsor. Changes recommendation from referral to HAC to direction to City Manager, adds direction to the City Manager to send a letter to BUSD, further clarifies background section, and removes original attachments.

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Item 41
Supplemental 2

CONSENT CALENDAR
July 25, 2017

To: Honorable Mayor and Members of the City Council

From: Councilmembers Sophie Hahn, Kate Harrison and Mayor Jesse Arreguín

Subject: Direct the City Manager to draft an ordinance to waive certain fees for Berkeley Housing Trust Fund projects and send a letter to BUSD Board of Education requesting consideration of a waiver of School Facility Fees for Berkeley Housing Trust Fund Projects.

RECOMMENDATION

1. Direct the City Manager to draft an ordinance establishing automatic waiver of certain administrative, permit, impact and other fees for projects receiving City of Berkeley Housing Trust Fund (HTF) monies and submit a draft within 90 days for Council approval.

   Fee waivers shall apply to all HTF projects that have not yet been issued a building permit, and should include, but not be limited to:
   a. Waiver of internal, staff-time-related permit, inspection, and other fees;
   b. Waiver of mitigation, impact, and in-lieu fees.
   c. Notwithstanding the above, fees to cover City "out of pocket" costs, fees passed-through to other agencies, and fees necessitated by CEQA should not be waived.

2. Direct the City Manager to send a letter to the BUSD Board of Education requesting consideration of an automatic waiver of BUSD School Facility Fees for projects receiving City of Berkeley Housing Trust Funds.

FINANCIAL IMPLICATIONS

Staff time to draft ordinance and policies. In the future, possible optimization of the impact of Berkeley Affordable Housing Trust funds, ensuring they are used to support housing rather than administrative costs, and reduction in development-related administrative fees received by the City. (Note: It is expected that no more than 1-2 projects qualifying for automatic waivers will seek permits in any given 5 year period.)

BACKGROUND

The City of Berkeley has established a Housing Trust Fund (HTF) to support the creation of affordable housing in Berkeley. This fund is a critical tool to increase Berkeley's affordable housing stock. When HTF funds are granted to qualifying projects, the City should ensure that the applicant is able to maximize the impact of these monies for the project itself.

A variety of fees are levied on development projects. Some cover the City's own internal processing costs, while others are collected to cover costs for outside consultants or passed on to other agencies. Impact, mitigation, and in-lieu fees are also assessed to compensate for impacts or for deviations from building standards. Fees also can operate as mitigations for environmental impacts and can be implicated in CEQA.

Permit and administrative fee waivers or deferrals are already allowed on a case by case basis for a variety of fees. For example, BMC Chapter 19.62 allows the City Manager to waive permit fees for housing projects in which at least 25% of its units are low and/or moderate income housing. Permit Fees are defined as "any fee charged by the City of Berkeley for any permit in connection with residential construction and any associated demolition" BMC § 19.62.020.G. Fees for permit applications or inspection for seismic retrofit work for eligible structures and buildings are also waived BMC § 19.66.030.

The process for obtaining these waivers is complex. BMC 23B.24.040 requires applicants to "file with the Director of Planning and Development a written request for a fee waiver or deferral which sets forth the reasons why such a waiver or deferral is necessary, prior to the acceptance of an application by the Zoning Officer". The waiver request is then reviewed by the City Manager, and granted at the City Manager's discretion. As a final step, the waiver is submitted to Council for review. Yet another section of the code waives affordable housing and childcare fees if a development meets certain qualifying criteria (BMC § 22.20), but does not waive SOSIP, in-lieu or other fees.

Given this incomplete patchwork of fee waiver provisions, each with its own process, obtaining waivers is a complicated and time-consuming process. Some waivers are granted statutorily, while others can only be granted upon request, and entail multi-tiered review. This item is intended to clarify fee waivers for projects receiving Berkeley HTF monies by granting automatic waivers of administrative, permit, impact and other fees across all City of Berkeley departments, and to collect in a single ordinance the fees that will be automatically waived. Fees to cover "out-of-pocket" costs such as costs

for outside consultants, other agency-mandated fees and fees necessitated by CEQA would not be waived.

Berkeley Unified School District (BUSD) also recently implemented the assessment of a School Facility Fee on new residential, commercial and industrial development, which took effect June 8, 2017. This item directs the City Manager to write a letter to the BUSD Board of Education requesting consideration of a waiver of the School Facility Fee for developments receiving Berkeley HTF monies, to match the City's action and to further reduce costs for the production of affordable housing in Berkeley.

ENVIRONMENTAL SUSTAINABILITY

This recommendation is consistent with Berkeley's environmental sustainability goals.

CONTACT PERSON

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Item 41
Supplemental 2

CONSENT CALENDAR
~~July 11~~July 25, 2017

To: Honorable Mayor and Members of the City Council

From: Councilmembers Sophie Hahn, Kate Harrison and Mayor Jesse Arreguin

Subject: Direct the City Manager to draft an ordinance to waive certain fees for Berkeley Housing Trust Fund projects and send a letter to BUSD Board of Education requesting consideration of a waiver of School Facility Fees for Berkeley Housing Trust Fund Projects.

~~Referral to the Housing Advisory Commission consideration of an ordinance to establish a waiver of administrative and permit fees for certain affordable housing projects~~

RECOMMENDATION

1. Direct the City Manager to draft an ordinance establishing automatic waiver of certain administrative, permit, impact and other fees for projects receiving City of Berkeley Housing Trust Fund (HTF) monies and submit a draft within 90 days for Council approval.

   Fee waivers shall apply to all HTF projects that have not yet been issued a building permit, and should include, but not be limited to:
   a. Waiver of internal, staff-time-related permit, inspection, and other fees;
   b. Waiver of mitigation, impact, and in-lieu fees.
   c. Notwithstanding the above, fees to cover City "out of pocket" costs, fees passed-through to other agencies, and fees necessitated by CEQA should not be waived.

2. Direct the City Manager to send a letter to the BUSD Board of Education requesting consideration of an automatic waiver of BUSD School Facility Fees for projects receiving City of Berkeley Housing Trust Funds.

~~Refer to the Housing Advisory Commission and City Manager the creation of an ordinance to establish an automatic waiver of administrative and permit fees for certain affordable housing projects, in particular those projects qualifying for Housing Trust Fund or other Berkeley affordable housing monies. A proposed ordinance is attached for consideration as one possible model.~~

FINANCIAL IMPLICATIONS

Staff time to ~~review~~ draft ordinance and policies. In the future, possible optimization of the impact of Berkeley ~~a~~Affordable ~~h~~Housing Trust funds, ensuring they are used to support housing rather than administrative costs, and reduction in development-related administrative fees received by the City ~~for permitting and development of housing~~. (Note: It is expected that no more than 1-2 projects qualifying for automatic waivers will seek permits in any given 5 year period.)

BACKGROUND

The City of Berkeley has established a Housing Trust Fund (HTF) to support the creation of affordable housing in Berkeley. This fund is a critical tool to increase Berkeley's affordable housing stock. ~~In addition, other Berkeley affordable housing funds may be available to support affordable housing projects.~~ When ~~City of Berkeley~~ HTF funds are granted to qualifying projects, the City should ensure that the applicant is able to maximize the impact of these ~~public funds~~ monies for the project itself ~~rather than for payment of the City's development-related administrative fees~~.

A variety of fees are levied on development projects. Some cover the City's own internal processing costs, while others are collected to cover costs for outside consultants or passed on to other agencies. Impact, mitigation, and in-lieu fees are also assessed to compensate for impacts or for deviations from building standards. Fees also can operate as mitigations for environmental impacts and can be implicated in CEQA.

Permit and administrative fee waivers or deferrals are already allowed on a case by case basis for a variety of fees. For example, BMC Chapter 19.62 allows the City Manager to waive permit fees for housing projects in which at least 25% of its units are low and/or moderate income housing. Permit Fees are defined as "any fee charged by the City of Berkeley for any permit in connection with residential construction and any associated demolition" BMC § 19.62.020.G. Fees for permit applications or inspection for seismic retrofit work for eligible structures and buildings are also waived BMC § 19.66.030.

The process for obtaining these waivers is complex. BMC 23B.24.040 requires applicants to "file with the Director of Planning and Development a written request for a fee waiver or deferral which sets forth the reasons why such a waiver or deferral is necessary, prior to the acceptance of an application by the Zoning Officer". The waiver request is then reviewed by the City Manager, and granted at the City Manager's discretion. As a final step, the waiver is submitted to Council for review. Yet another section of the code waives affordable housing and childcare fees if a development

meets certain qualifying criteria (BMC § 22.20), but does not waive SOSIP, in-lieu or other fees.

Given this incomplete patchwork of fee waiver provisions, each with its own process, obtaining waivers is a complicated and time-consuming process. Some waivers are granted statutorily, while others can only be granted upon request, and entail multi-tiered review. This item is intended to clarify fee waivers for projects receiving Berkeley HTF monies by granting automatic waivers of administrative, permit, impact and other fees across all City of Berkeley departments, and to collect in a single ordinance the fees that will be automatically waived. Fees to cover "out-of-pocket" costs such as costs for outside consultants, other agency-mandated fees and fees necessitated by CEQA would not be waived.

Berkeley Unified School District (BUSD) also recently implemented the assessment of a School Facility Fee on new residential, commercial and industrial development, which took effect June 8, 2017. This item directs the City Manager to write a letter to the BUSD Board of Education requesting consideration of a waiver of the School Facility Fee for developments receiving Berkeley HTF monies, to match the City's action and to further reduce costs for the production of affordable housing in Berkeley.

~~Permit fee waivers or deferrals are already permitted under BMC Chapter 23B.24.040 on a case by case basis, and require a time consuming process. Affordable housing developers putting together financing for their projects do not know from the outset whether or not waivers will be granted, and are unable to reflect the potentially reduced costs in their plans.~~

~~Chapter 23B.24.040 states:~~

> ~~*"The City Manager may waive or defer the payment of Permit fees, if he or she finds that the project will provide a significant public service or benefit, and that the waiver or deferral is necessary to make the project economically feasible to construct or establish. The City Manager shall also notify the Council of any request for fee waiver. The Council may review and may grant, wholly or in part, or deny such request for a fee waiver."*~~

~~The process to obtain permit fee waivers requires applicants to submit a written request to the Director of Planning and Development, which is then sent to the City Manager for consideration. The City Manager must make two determinations about the project:~~

> ~~(1) whether it provides a significant public service or benefit, and~~

(2) whether the waiver is economically necessary to complete the project.

The City Manager next is required to notify the City Council of any project receiving a waiver of fees, and the Council has the authority to review, grant, modify, or deny the waiver. Finally, the City Manager must send a letter authorizing the waiver to the Planning Department. *All* of these steps must occur *before* a development application can be deemed complete. This complex process has the potential to significantly delay a project's application and creates uncertainty at the project planning stage.

A number of cities offer fee waivers and deferments to affordable housing projects. Austin, TX waives all fees, including impact fees and administrative fees, if the development is safe, mixed-income, accessible, reasonably priced, transit-oriented, and compliant with the City's Green Building Standards.[1]

Puyallup, WA offers a waiver of building and construction permit fees if the residential structure is intended for low-income families, the construction of the structure involves some volunteer labor, or the structure is being constructed by an organization classified as a nonprofit organization by the Internal Revenue Service.[2][3]

It would be optimal to automatically waive permit fees for projects receiving Berkeley affordable housing funds, to expedite the completion of affordable projects and reduce the amount of affordable housing monies spent on the City's own administrative fees.

Affordable housing built in Berkeley provides a significant public benefit to the community. A permit fee waiver is likely to help with the economic feasibility. Finally, applicants receiving affordable housing funds from the City of Berkeley will be able to make full use of these monies for the intended housing.

ENVIRONMENTAL SUSTAINABILITY

This recommendation is consistent with Berkeley's environmental sustainability goals.

CONTACT PERSON

Councilmember Sophie Hahn, Council District 5, (510) 981-7150

ATTACHMENTS

DRAFT Ordinance amending BMC 23B.24.040

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[1] http://www.austintexas.gov/edims/document.cfm?id=111622

[2] http://mrsc.org/Home/Explore-Topics/Planning/Specific-Planning-Subjects,-Plan-Elements/Affordable-Housing-Ordinances-Flexible-Provisions.aspx

[3] http://www.codepublishing.com/WA/Puyallup/html/Puyallup17/Puyallup1704.html#17.04.080

ORDINANCE NO. #,###-N.S.

ESTABLISHING A WAIVER OF PERMIT FEES FOR CERTAIN AFFORDABLE HOUSING PROJECTS, IN PARTICULAR PROJECTS QUALIFYING FOR HOUSING TRUST FUND OR OTHER CITY OF BERKELEY AFFORDABLE HOUSING FUNDS

BE IT ORDAINED by the Council of the City of Berkeley as follows:

Section 1. That Berkeley Municipal Code Section 23B.24.040 is amended to read as follows:

BMC Section 23B.24.040 Payment, Waiver and Refund of Application Fees

A. Applications for Permits shall be accompanied by the fees as set by resolution of the Council. Payment of the fee is required in order for an application to be complete under the Permit Streamlining Act (PSA), and absent payment of the fee, the application will not be processed unless a fee waiver or deferral is approved as set forth below.

B. No fee shall be required when the applicant is the City, or if it is waived under any other provision of the BMC.

C. In addition to seeking fee waivers under other provisions of the BMC, any applicant may file with the Director of Planning and Development a written request for a fee waiver or deferral which sets forth the reasons why such a waiver or deferral is necessary, prior to the acceptance of an application by the Zoning Officer. The Director of Planning and Development shall forward the request to the City Manager. The City Manager may waive or defer the payment of Permit fees, if he or she finds that the project will provide a significant public service or benefit, and that the waiver or deferral is necessary to make the project economically feasible to construct or establish. The City Manager shall also notify the Council of any request for fee waiver. The Council may review and may grant, wholly or in part, or deny such request for a fee waiver. A letter from the City Manager authorizing the fee waiver or deferral shall be submitted in lieu of a fee before an application will be accepted. Each fee waiver or deferral request shall include a breakdown of all applicable Current Planning Fees, as set forth in the current Fee Resolution.

D. If an application is withdrawn prior to a decision, the applicant may be eligible for a refund of a portion of the fee. The amount of the refund shall be determined by the Zoning Officer based on the level of staff review conducted to date. Refunds of fees shall not be made for applications that have been denied.

~~Section 2. Copies of this Ordinance shall be posted for two days prior to adoption in the display case located near the walkway in front of Council Chambers, 2134 Martin Luther King Jr. Way. Within 15 days of adoption, copies of this Ordinance shall be filed at each branch of the Berkeley Public Library and the title shall be published in a newspaper of general circulation.~~

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ACTION CALENDAR
September 12, 2017
(Continued from July 25, 2017)

To: Honorable Mayor and Members of the City Council

From: Councilmembers Sophie Hahn and Kate Harrison

Subject: Referral to the Housing Advisory Commission Consideration of an Ordinance to Establish a Waiver of Administrative and Permit Fees for Certain Affordable Housing Projects

RECOMMENDATION
Refer to the Housing Advisory Commission and City Manager the creation of an ordinance to establish an automatic waiver of administrative and permit fees for certain affordable housing projects, in particular those projects qualifying for Housing Trust Fund or other Berkeley affordable housing monies. A proposed ordinance is attached for consideration as one possible model.

FINANCIAL IMPLICATIONS
Staff time to review ordinance and policies. In the future, possible optimization of the impact of Berkeley affordable housing funds, to support housing rather than administrative costs, and reduction in development-related administrative fees received by the City for permitting and development of housing.

BACKGROUND
The City of Berkeley has established a Housing Trust Fund to support the creation of affordable housing in Berkeley. This fund is a critical tool to increase Berkeley's affordable housing stock. In addition, other Berkeley affordable housing funds may be available to support affordable housing projects. When City of Berkeley funds are granted to qualifying projects, the City should ensure that the applicant is able to maximize the impact of these public funds for the project itself rather than for payment of the City's development-related administrative fees.

Permit fee waivers or deferrals are already permitted under BMC Chapter 23B.24.040 on a case by case basis, and require a time consuming process. Affordable housing developers putting together financing for their projects do not know from the outset whether or not waivers will be granted, and are unable to reflect the potentially reduced costs in their plans.

Chapter 23B.24.040 states:

> *"The City Manager may waive or defer the payment of Permit fees, if he or she finds that the project will provide a significant public service or benefit, and that the waiver or deferral is necessary to make the project economically feasible to construct or establish. The City Manager shall also notify the Council of any request for fee waiver. The Council may review and may grant, wholly or in part, or deny such request for a fee waiver."*

The process to obtain permit fee waivers requires applicants to submit a written request to the Director of Planning and Development, which is then sent to the City Manager for consideration. The City Manager must make two determinations about the project:

(1) whether it provides a significant public service or benefit, and
(2) whether the waiver is economically necessary to complete the project.

The City Manager next is required to notify the City Council of any project receiving a waiver of fees, and the Council has the authority to review, grant, modify, or deny the waiver. Finally, the City Manager must send a letter authorizing the waiver to the Planning Department. *All* of these steps must occur *before* a development application can be deemed complete. This complex process has the potential to significantly delay a project's application and creates uncertainty at the project planning stage.

A number of cities offer fee waivers and deferments to affordable housing projects. Austin, TX waives all fees, including impact fees and administrative fees, if the development is safe, mixed-income, accessible, reasonably priced, transit-oriented, and compliant with the City's Green Building Standards.[1]

Puyallup, WA offers a waiver of building and construction permit fees if the residential structure is intended for low-income families, the construction of the structure involves some volunteer labor, or the structure is being constructed by an organization classified as a nonprofit organization by the Internal Revenue Service.[2][3]

It would be optimal to automatically waive permit fees for projects receiving Berkeley affordable housing funds, to expedite the completion of affordable projects and reduce the amount of affordable housing monies spent on the City's own administrative fees.

Affordable housing built in Berkeley provides a significant public benefit to the community. A permit fee waiver is likely to help with the economic feasibility. Finally, applicants receiving affordable housing funds from the City of Berkeley will be able to make full use of these monies for the intended housing.

ENVIRONMENTAL SUSTAINABILITY

This recommendation is consistent with Berkeley's environmental sustainability goals.

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[1] http://www.austintexas.gov/edims/document.cfm?id=111622

[2]http://mrsc.org/Home/Explore-Topics/Planning/Specific-Planning-Subjects,-Plan-Elements/Affordable-Housing-Ordinances-Flexible-Provisions.aspx

[3] http://www.codepublishing.com/WA/Puyallup/html/Puyallup17/Puyallup1704.html#17.04.080

CONTACT PERSON
Councilmember Sophie Hahn, Council District 5, (510) 981-7150

ATTACHMENTS
1. DRAFT Ordinance amending BMC 23B.24.040

ORDINANCE NO. #,###-N.S.

ESTABLISHING A WAIVER OF PERMIT FEES FOR CERTAIN AFFORDABLE HOUSING PROJECTS, IN PARTICULAR PROJECTS QUALIFYING FOR HOUSING TRUST FUND OR OTHER CITY OF BERKELEY AFFORDABLE HOUSING FUNDS

BE IT ORDAINED by the Council of the City of Berkeley as follows:

Section 1. That Berkeley Municipal Code Section 23B.24.040 is amended to read as follows:

BMC Section 23B.24.040 Payment, Waiver and Refund of Application Fees

A. Applications for Permits shall be accompanied by the fees as set by resolution of the Council. Payment of the fee is required in order for an application to be complete under the Permit Streamlining Act (PSA), and absent payment of the fee, the application will not be processed unless a fee waiver or deferral is approved as set forth below.

B. No fee shall be required when the applicant is the City, or if it is waived under any other provision of the BMC.

C. In addition to seeking fee waivers under other provisions of the BMC, any applicant may file with the Director of Planning and Development a written request for a fee waiver or deferral which sets forth the reasons why such a waiver or deferral is necessary, prior to the acceptance of an application by the Zoning Officer. The Director of Planning and Development shall forward the request to the City Manager. The City Manager may waive or defer the payment of Permit fees, if he or she finds that the project will provide a significant public service or benefit, and that the waiver or deferral is necessary to make the project economically feasible to construct or establish. The City Manager shall also notify the Council of any request for fee waiver. The Council may review and may grant, wholly or in part, or deny such request for a fee waiver. A letter from the City Manager authorizing the fee waiver or deferral shall be submitted in lieu of a fee before an application will be accepted. Each fee waiver or deferral request shall include a breakdown of all applicable Current Planning Fees, as set forth in the current Fee Resolution.

D. Fees shall be automatically waived for projects receiving City of Berkeley Affordable Housing Funds from the Housing Trust Fund or any other City of Berkeley Affordable Housing funding source.

~~D~~E. If an application is withdrawn prior to a decision, the applicant may be eligible for a refund of a portion of the fee. The amount of the refund shall be determined by the Zoning Officer based on the level of staff review conducted to date. Refunds of fees shall not be made for applications that have been denied.

Section 2. Copies of this Ordinance shall be posted for two days prior to adoption in the display case located near the walkway in front of Council Chambers, 2134 Martin Luther King Jr. Way. Within 15 days of adoption, copies of this Ordinance shall be filed at each branch of the Berkeley Public Library and the title shall be published in a newspaper of general circulation.

Susan Wengraf
Councilmember District 6

CONSENT CALENDAR
May 2, 2017

To: Honorable Mayor and Members of the City Council

From: Councilmembers Susan Wengraf, Lori Droste, and Ben Bartlett

Subject: Referral to Planning Commission to Provide Ordinance Language for the Creation of Junior ADUs

RECOMMENDATION

Refer to the Planning Commission to provide ordinance language for the creation of Junior ADUs and return to City Council for adoption

BACKGROUND

High housing costs, particularly in the Bay Area, along with demographic increases in our aging population, have prompted the City of Berkeley to find opportunities to encourage a variety of options in our housing stock.

Junior ADUs are created by re-purposing a bedroom and ancillary space within an existing home. State law limits Junior ADUs to a maximum of 500 square feet (sf) of living space contained entirely within an existing single-family structure. A Junior ADU unit may include separate bathroom facilities, or may share facilities with the existing structure. They have a private exterior entrance and are separate from the main living area, however, the connecting door remains and can be secured from both sides.

Junior ADUs do not redefine single-family homes, as the door adjoining the Junior Unit to the main living area remains in place. They do not increase density as the living and sleeping capacity of a home does not change (e.g., a four bedroom home converted to a three bedroom home with one Junior ADU still only has four bedrooms). The requirements for water and energy, the need for parking, and the impact on local roads have all been accounted for in the original permit for the home. All that is needed to create a Junior ADU is a bar sink, a standard set of electrical outlets to accommodate small kitchen appliances, access to a bathroom, and an exterior entrance.

Assembly member Tony Thurmond introduced legislation to remove financial and bureaucratic barriers to the creation of Junior ADU's in his Assembly Bill AB2406 which was signed into law by Governor Jerry Brown in September, 1916.

The ordinance authorized by AB 2406 must include the following requirements:

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E-Mail: swengraf@cityofberkeley.info

- Limit to one JADU per residential lot zoned for single-family residences with a single-family residence already built on the lot.
- The single-family residence in which the JADU is created or JADU must be occupied by the owner of the residence.
- The owner must record a deed restriction stating that the JADU cannot be sold separately from the single family residence and restricting the JADU to the size limitations and other requirements of the JADU ordinance.
- The JADU must be located entirely within the existing structure of the single-family residence and JADU have its own separate entrance.
- The JADU must include an efficiency kitchen which includes a sink, cooking appliance, counter surface, and storage cabinets that meet minimum building code standards. No gas or 220V circuits are allowed.
- The JADU may share a bath with the primary residence or have its own bath.

AB 2406 prohibits a local JADU ordinance from requiring:

- Additional parking as a condition to grant a permit.
- Applying additional water, sewer and power connection fees. No connections are needed as these utilities have already been accounted for in the original permit for the home.
- AB 2406 clarifies that a JADU is to be considered part of the single-family residence for the purposes of fire and life protections ordinances and regulations, such as sprinklers and smoke detectors. The bill also requires life and protection ordinances that affect single-family residences to be applied uniformly to all single-family residences, regardless of the presence of a JADU.

FINANCIAL IMPLICATIONS
Staff time.

ENVIRONMENTAL SUSTAINABILITY
NA

CONTACT PERSON
Councilmember Susan Wengraf Council District 6 510-981-7160

Jesse Arreguín
City Councilmember, District 4

ACTION CALENDAR
April 26, 2016

To: Honorable Mayor and Members of the City Council

From: Councilmember Jesse Arreguín

Subject: Referral to Planning Commission: City-Wide Green Development Requirements

RECOMMENDATION
Refer to the Planning Commission to draft an ordinance requiring the same Green Building and Transportation Demand Management (TDM) measures required in the Commercial Downtown Mixed Use District (C-DMU) for projects of 75 units or more throughout the City of Berkeley's commercial zoning districts.

The following standards would apply to larger projects city-wide:

1. Bicycle parking spaces shall be provided for new construction at the ratio of one space per 2,000 square feet of gross floor area of commercial space, and in accordance with the requirements of Section 23E.28.070.

Number of Parking Spaces Required	Minimum Number of Vehicle Sharing Spaces
0-10	0
11-30	1
30-60	2
61 or more	3, plus one for every additional 60 spaces

- For residential structures constructed or converted from a non-residential use that require vehicle parking under Section 23E.68.080.B, required parking spaces shall be designated as vehicle sharing spaces in the amounts specified in the adjacent table. If no parking spaces are provided pursuant to Section 23E.68.080.D, no vehicle sharing spaces shall be required.

- The required vehicle sharing spaces shall be offered to vehicle sharing service providers at no cost.

2. The vehicle sharing spaces required by this section shall remain available to a vehicle sharing service provider as long as providers request the spaces. If no vehicle sharing service provider requests a space, the space may be leased for use by other vehicles. When a vehicle sharing service provider requests such space, the property owner shall make the space available within 90 days.

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Fax: (510) 981-7144 ● TDD: (510) 981-6903 ● E-Mail: jarreguin@cityofberkeley.info ● Web: www.jessearreguin.com

3. Occupants of residential units or GLA units constructed, newly constructed or converted from a non-residential use shall not be eligible for Residential Parking Permit (RPP) permits under Chapter 14.72 of the BMC.

4. For any new building with residential units or structures converted to a residential use, required parking spaces shall be leased or sold separate from the rental or purchase of dwelling units for the life of the dwelling unit, unless the Board grants a Use Permit to waive this requirement for projects which include financing for affordable housing subject to the finding in section 23E.68.090.I.

5. Construction of new developments of at least 75 units shall attain a LEED Gold rating or higher as defined by the U.S. Green Building Council (USGBC), or shall attain building performance equivalent to this rating, as determined by the Zoning Officer.

6. New developments of at least 75 units shall be required to meet all applicable standards of the Stopwaste Small Commercial Checklist, or equivalent, as determined by the Zoning Officer. The rating shall be appropriate to the use type of the proposed construction.

7. New developments of at least 75 units, the property owner shall provide at least one of the following transportation benefits at no cost to every employee, residential unit, and/or GLA resident. A notice describing these transportation benefits shall be posted in a location or locations visible to employees and residents.

    - A pass for unlimited local bus transit service; or

    - A functionally equivalent transit benefit in an amount at least equal to the price of a non-discounted unlimited monthly local bus pass. Any benefit proposed as a functionally equivalent transportation benefit shall be approved by the Zoning Officer in consultation with the Transportation Division Manager.

<u>BACKGROUND:</u>
One of the main goals of the 2012 Downtown Area Plan (DAP) is promoting sustainability in the Downtown by "*Integrat[ing] environmentally sustainable development and practices in the Downtown, and in every aspect of the Downtown Area Plan*" and to "*Model best practices for sustainability*".[1]

The DAP and its implementing zoning includes a number of green building and sustainable transportation requirements for new projects throughout the Downtown. These green measures are resulting in sustainable projects with bike and car share parking, and meeting LEED Gold standards. These forward thinking policies go a long way in helping Berkeley meet its climate action goals, but they only apply to projects in the Downtown area. Large projects throughout the city should be held to the same standard. This will result in further reducing greenhouse gases from transportation and building energy use.

[1] 2012 Downtown Area Plan, page IN-18

An update on the Climate Action Plan (CAP) presented to the City Council in November 2015 showed that the City is not on track to achieve the goals set by the Plan. While Berkeley has achieved more reductions compared to the rest of the State, despite population increases, it is clear that more must be done if we are to reach the targets set forward in the CAP. By holding large developments to the same standards as those in Downtown, we can achieve the goals of sustainability by reducing greenhouse gases.

FINANCIAL IMPLICATIONS:
Staff time to prepare zoning amendments for Planning Commission consideration.

ENVIRONMENTAL SUSTAINABILITY
Applying the same standards to large developments citywide can significantly improve the City's ability to meet the goals of the Climate Action Plan.

CONTACT PERSON
Jesse Arreguin, City Councilmember, District 4 510-981-7140

Berkeley City Council

ACTION CALENDAR
March 14, 2017

To: Honorable Mayor and Members of the City Council

From: ~~Councilmember~~ Mayor Jesse Arreguín and Councilmember Sophie Hahn

Subject: Berkeley Deep Green Building Initiative

RECOMMENDATION

Refer to the City Manager and Energy Commission the development of a comprehensive, integrated "Deep Green Building" program ~~policies and programs~~ to improve the energy efficiency and sustainability of Berkeley buildings, ~~based on~~ drawing from ~~ideas proposed in~~the community's Berkeley Deep Green Building proposal and other cutting-edge green building initiatives~~programs~~ and ~~and tying into~~ integrating BESO and other ~~current~~ existing and proposed C~~c~~ity programs into a multifaceted, complete and innovative Deep Green Building program.

BACKGROUND

The Berkeley Climate Action Plan (CAP) sets a bold goal of reducing greenhouse gas emissions (GHG) by 33% of 2000 levels by 2020, and 80% by 2050. At a November 2015 worksession, it was reported that as of 2013, GHG emissions have been reduced by only 9%. Although ahead of statewide trends, the trajectory of ~~this~~ progress is not great enough to meet ~~these~~ Berkeley's CAP targets within the ~~set~~ desired timeline.

According to the CAP, commercial and residential buildings account for ~~53~~45% of the city's GHG emissions. Berkeley has done a lot to reduce these emissions such as focusing ~~on~~ the construction of new development along transit corridors and promoting alternative transportation. However, transit-oriented development can miss the mark if ~~the~~ buildings themselves use excessive energy and water over their lifetime, ~~or~~ are built with energy intensive or~~,~~ toxic materials or use materials from vendors who do not respect progressive labor, human rights or environmental standards. Published in April 2016, the Berkeley Resilience Strategy also recognize~~d~~ the importance of ~~these~~ GHG reductions and specifically recommend~~ed~~ ~~we~~ that Berkeley adopt policies ~~that~~ switching buildings to cleaner energy.

Berkeley Deep Green Building is an ambitious ~~an incentive-based~~ program thoughtfully designed ~~over the past year~~ by building and clean energy professionals and environmentally-minded citizens as part of the Berkeley Zero Net Energy++ Working Group. It responds directly to the first goal of the City's Climate Action Plan, which calls for "new and existing Berkeley buildings [to] achieve zero net energy consumption through increased energy efficiency and a shift to renewable energy sources". Its purpose is to incorporate practices that support zero net energy at the building and

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community scale – ultra-efficient construction and deep energy retrofit projects that consume only as much energy as they produce from clean, renewable resources. The program sets forward a detailed plan to incentivize these practices, and provides guidance on how to prioritize work in a way that best supports Berkeley's climate and overall environmental ~~action~~ goals.

~~The program responds directly to the first goal of the CAP, which calls for "new and existing Berkeley buildings [to] achieve zero net energy consumption through increased energy efficiency and a shift to renewable energy sources". It also fits into BESO, and State codes and programs including Title 24, Energy Upgrade California and the California Advanced Home Program. Berkeley Deep Green Building would be offered as a two-level system and initially be voluntary with valuable incentives tied to compliance. Over time, voluntary components would be incorporated into the code, either at the State level or by the City of Berkeley. Since the program goals are tied so closely to California's long-term energy goals, projects would be eligible for a number of energy efficiency incentives already offered by the State and PG&E.~~

The five main goals of the community's Berkeley Deep Green Building proposal are to:

1. Support zero-net energy at the individual building and community scale;~~.~~
2. Reduce embodied energy in building materials and practices;~~.~~
3. Reduce toxicity in building materials;~~.~~
4. Source sustainability produced materials from fair trade, fair wage and culturally and environmentally friendly suppliers; and~~.~~
5. Conserve water.

~~Level one includes high-impact sustainability measures that address energy efficiency, toxicity, responsible sourcing, and water use. These measures are the easiest to achieve and tie into Title 24 and other state-level efforts to arrive at zero net energy. Level two includes measures that are more stringent and offer greater impact in achieving environmental and GHG reduction goals. Deep Green Building is intended to encourage/incentivize most projects to comply with level one, while further incentivizing/rewarding level two projects to take on the highest level of environmental stewardship.~~

~~**Level One**~~

~~**1. Above-Code Energy Efficiency**~~
~~Site energy use intensity (EUI) maximum consumption of 20 kBtu/ sq. ft. /yr for new construction and 25 - 30 kBtu/sq. ft. /yr for remodels above a certain threshold size without consideration of solar hot water or PV.~~

~~**2. Prescriptive Energy Efficiency Measures on top of Performance Measures**~~
~~Create all-electric buildings.100% high-efficacy lighting, including LED and CFL. New appliances must meet the highest Energy Star rating or equivalent. At least one outlet in each room will be switched.~~

~~3. **State-Defined "Solar Ready" Plus Additional Measures, where Sufficient Solar Access Exists**~~
~~Provide the necessary components to make buildings solar ready.~~

~~4. **Cleaner Installation**~~
~~Installation free of organohalogen flame retardants. Low global warming potential insulation.~~

~~5. **Pre-Remodel BESO Assessment of Home Energy Efficiency**~~
~~Submit paperwork from BESO assessment with permit application for remodel.~~

~~6. **Post-Remodel energy, comfort, and air quality monitoring**~~
~~For a period of one year following completion of construction, monitoring will be carried out for the following parameters: hot water use, appliance loads, space heating loads, interior temperature, relative humidity and CO2 levels.~~

~~7. **Forest Stewardship Council (FSC) Certified Wood**~~
~~FSC certified wood and wood products are to be used when available.~~

~~8. **Water Conservation**~~
~~Maximize permeable paving. Landscaping shall include 75% native plants or drought tolerate plants, and plants will be hydrozoned based on water needs. New plumbing for laundry machines, showers, and bathtubs will be greywater ready.~~

~~**Level Two**~~

~~1. **Higher Above-Code Energy Efficiency**~~
~~Energy use intensity maximum of 14kBtu/ sq. ft./yr site energy for both new construction and remodels above a certain threshold.~~

~~2. **Reduced Embodied Energy**~~
~~New concrete and kiln-fired brick, pavers, etc. cannot be used for non-structural purposes and should not be used in excessive amounts for structural purposes. Specify concrete with global warming potential 30% or more below standard mixes. Engineered wood in lieu of steel/concrete.~~

~~3. **Solar Photovoltaic (PV) System and/or Solar Thermal System Sufficient to Achieve Zero Net Energy for the Building, where Sufficient Solar Access Exists**~~
~~Where sufficient solar access exists, install a solar PV and/or solar thermal system, sized as required to achieve zero net energy for the building.~~

~~4. **Reduced Toxicity through Avoidance of Living Building Challenge Red List Chemicals**~~
~~Projects cannot use products that contain chemicals on the Living Building Challenge Red List.~~

~~**5. Advanced Water Conservation Measures**~~

~~Direct all shower/tub water to permitted outdoor greywater system. A minimum 1000 gallon rainwater system to be used for toilets and/or laundry.~~

The City of Berkeley has a variety of programs and Building and Zoning Code provisions that seek to address green building. These include energy efficiency audits under BESO, LEED gold standards for larger downtown buildings, Bay-friendly landscaping for projects over a certain size, and stormwater and waste management during construction. In addition, a number of solar, energy efficiency and other green building proposals have been referred to the City Manager over time. Despite the great value of each of these elements, Berkeley lacks a complete, complimentary and coordinated set of policies, resulting in lost opportunities to improve the sustainability of existing and newly built buildings.

This referral directs the City Manager to pro-actively develop a single, comprehensive Deep Green Building Program incorporating best practices for energy efficiency/ZNE, reduced embodied energy, water conservation, low or no toxicity, socially and environmentally progressive sourcing and other important elements, as may be identified.

To best realize the goals of Berkeley's Climate Action and Resilience Plans and continue Berkeley's leadership on environmental issues, the City's Deep Green Building Program should consider the community's well-developed Berkeley Deep Green Building proposal, existing and proposed City policies and programs, the State's Zero Net Energy program and policies, and programs, policies, and cutting edge initiatives being implemented in other communities.
~~Similar programs have been adopted by cities that are leaders in sustainability, such as Portland's Green Building and Development Program. Incorporating this proposal into City of Berkeley policy would not only help us meet our GHG emission reduction targets, but serve as a model for other cities to follow.~~

FINANCIAL IMPLICATIONS

Staff time.

ENVIRONMENTAL SUSTAINABILITY

Establishing new green building goals and codifying or incentivizing their achievement ~~es for achieving them. The practices outlined in the Deep Green Buildings proposal~~ will help Berkeley achieve the goals of the Climate Action Plan~~,~~ and Resiliency Strategy~~, and~~ as well as statewide goals to reduce greenhouse gas emissions and move towards zero net energy buildings.

CONTACT PERSON

~~Jesse Arreguin, Councilmember, District 4 510-981-7140~~
Jesse Arreguín, Mayor 510-981-7100
Sophie Hahn, Councilmember, District 5 510-981-7150

Attachments:
1: Berkeley Deep Green Building~~s~~ Proposal

Berkeley City Council

ACTION CALENDAR
March 14, 2017

To: Honorable Mayor and Members of the City Council

From: Mayor Jesse Arreguín and Councilmember Sophie Hahn

Subject: Berkeley Deep Green Building Initiative

RECOMMENDATION

Refer to the City Manager and Energy Commission the development of a comprehensive, integrated "Deep Green Building" program to improve the energy efficiency and sustainability of Berkeley buildings, drawing from the community's Berkeley Deep Green Building proposal and other cutting-edge green building initiatives and integrating BESO and other existing and proposed City programs into a multifaceted, complete and innovative Deep Green Building program.

BACKGROUND

The Berkeley Climate Action Plan (CAP) sets a bold goal of reducing greenhouse gas emissions (GHG) by 33% of 2000 levels by 2020, and 80% by 2050. At a November 2015 worksession, it was reported that as of 2013, GHG emissions have been reduced by only 9%. Although ahead of statewide trends, the trajectory of progress is not great enough to meet Berkeley's CAP targets within the desired timeline.

According to the CAP, commercial and residential buildings account for 45% of the city's GHG emissions. Berkeley has done a lot to reduce these emissions such as focusing the construction of new development along transit corridors and promoting alternative transportation. However, transit-oriented development can miss the mark if buildings themselves use excessive energy and water over their lifetime, are built with energy intensive or toxic materials or use materials from vendors who do not respect progressive labor, human rights or environmental standards. Published in April 2016, the Berkeley Resilience Strategy also recognizes the importance of GHG reductions and specifically recommends that Berkeley adopt policies switching buildings to cleaner energy.

Berkeley Deep Green Building is an ambitious program thoughtfully designed by building and clean energy professionals and environmentally-minded citizens as part of the Berkeley Zero Net Energy++ Working Group. It responds directly to the first goal of the City's Climate Action Plan, which calls for "new and existing Berkeley buildings [to] achieve zero net energy consumption through increased energy efficiency and a shift to renewable energy sources". Its purpose is to incorporate practices that support zero net energy at the building and community scale – ultra-efficient construction and deep energy retrofit projects that consume only as much energy as they produce from clean,

renewable resources. The program sets forward a detailed plan to incentivize these practices, and provides guidance on how to prioritize work in a way that best supports Berkeley's climate and overall environmental goals.

The five main goals of the community's Berkeley Deep Green Building proposal are to:

1. Support zero-net energy at the individual building and community scale;
2. Reduce embodied energy in building materials and practices;
3. Reduce toxicity in building materials;
4. Source sustainability produced materials from fair trade, fair wage and culturally and environmentally friendly suppliers; and
5. Conserve water.

The City of Berkeley has a variety of programs and Building and Zoning Code provisions that seek to address green building. These include energy efficiency audits under BESO, LEED gold standards for larger downtown buildings, Bay-friendly landscaping for projects over a certain size, and stormwater and waste management during construction. In addition, a number of solar, energy efficiency and other green building proposals have been referred to the City Manager over time. Despite the great value of each of these elements, Berkeley lacks a complete, complimentary and coordinated set of policies, resulting in lost opportunities to improve the sustainability of existing and newly built buildings.

This referral directs the City Manager to pro-actively develop a single, comprehensive Deep Green Building Program incorporating best practices for energy efficiency/ZNE, reduced embodied energy, water conservation, low or no toxicity, socially and environmentally progressive sourcing and other important elements, as may be identified.

To best realize the goals of Berkeley's Climate Action and Resilience Plans and continue Berkeley's leadership on environmental issues, the City's Deep Green Building Program should consider the community's well-developed Berkeley Deep Green Building proposal, existing and proposed City policies and programs, the State's Zero Net Energy program and policies, and programs, policies, and cutting edge initiatives being implemented in other communities.

FINANCIAL IMPLICATIONS

Staff time.

ENVIRONMENTAL SUSTAINABILITY

Establishing new green building goals and codifying or incentivizing their achievement will help Berkeley achieve the goals of the Climate Action Plan and Resiliency Strategy as well as statewide goals to reduce greenhouse gas emissions and move towards zero net energy buildings.

CONTACT PERSON
Jesse Arreguín, Mayor 510-981-7100
Sophie Hahn, Councilmember, District 5 510-981-7150

Attachments:
1: Berkeley Deep Green Building Proposal

Berkeley DEEP GREEN Building

Promoting Sustainable Building Practices to advance Berkeley's Climate Action and Resiliency Goals

This proposal was conceived and prepared by the

Berkeley Zero Net Energy++ Working Group

A group of citizens and building professionals dedicated to making Berkeley's Building Code a model of green, non-toxic, sustainable building practices and achieving Berkeley's Climate Action Plan and Resilience Strategy goals by inspiring, educating and supporting the community

Founder:

Brian C. Harris

Co-Conveners:

Sophie Hahn and Cate Leger

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Supporters:

David Arkin, Carolyn Ely, Larry Strain

Executive Summary

Many new residential developments have been approved in the City of Berkeley in recent years, and even more are in the pipeline. At the same time, existing buildings comprise the vast majority of Berkeley's building stock. Most of these buildings, existing and new, consume excessive energy and water.

While many new projects have the benefit of being sited on transit corridors, they often fall short of their full potential to reduce environmental impacts because they do not incorporate best practices for Green Building. Berkeley's recently adopted Building Energy Savings Ordinance (BESO) helps identify potential energy conservation measures, but does not provide incentives and specific guidance to support homeowners, builders and developers in meeting Environmental and Greenhouse Gas (GHG) reduction goals.

Berkeley Deep Green Building proposes an incentive-based path towards buildings that meet Berkeley's environmental and GHG reduction goals, protect the health and safety of Berkeley workers and residents, and support the health and sustainability of communities across the globe. The program is intended to be voluntary and incentive-based in the beginning, leading to the adoption of mandatory measures in later stages. In line with the vision of California's Long Term Energy Efficiency Goals, the program would initially focus on the residential sector, to help achieve the State's 2020 residential sector energy goals. Over time, Berkeley Deep Green Building would incorporate measures for the non-residential sector, aligning with the State's 2030 targets for non-residential structures.

Berkeley Deep Green Building ties into Berkeley's Climate Action Plan and BESO, and into State codes and other programs such as Title 24, Energy Upgrade California and the California Advanced Home Program. In addition to new incentives to be provided by the City of Berkeley, homeowners, builders and developers participating in Berkeley Deep Green Building would be eligible for a number of incentives already offered by the State and PG&E.

Berkeley Deep Green participation would be offered in two Levels. Level 1 includes high impact sustainability measures that address energy efficiency, toxicity, responsible sourcing and water use. These measures are the easiest to achieve and tie into Title 24 and other State-level efforts to arrive at Net Zero Energy. Level 2 measures are more stringent and offer greater impact in achieving environmental and GHG reduction goals. Berkeley Deep Green is intended to encourage/incentivize most projects to comply with Level 1, while further incentivizing/rewarding Level 2 projects to take on the highest levels of environmental stewardship.

Berkeley Deep Green Building would not only help to achieve Berkeley's environmental and GHG reduction goals but can also be a model for other cities to follow, helping to achieve long term sustainability goals in communities across the United States, and around the globe.

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Introduction

Berkeley is building again. Over 2000 new units have been approved in the past 3 years, and many are under construction. Another thousand are in the pipeline—with more sure to come. Many of these new developments are on or near major transit corridors, qualifying them as 'transit-oriented development', which is environmentally preferable to development that is dependent on automobiles.

But while reducing dependence on automobiles is an important goal, transit-oriented development falls short of its potential when buildings themselves use excessive energy and water over their lifetimes or are built with energy intensive, toxic and/or unsustainably produced materials.

At the same time, existing structures form a sizeable percentage of Berkeley's building stock. Berkeley's recently enacted Building Energy Savings Ordinance (BESO) requires all home owners to audit their home performance and will help—over time—to identify energy efficiency improvements for existing buildings. However, there are few incentives to implement improvements and little guidance on how to prioritize work to best support climate change goals.

Berkeley Deep Green Building is a proposal for an incentive-based path toward buildings that meet Berkeley's environmental and greenhouse gas (GHG) reduction goals, protect the health and safety of Berkeley workers and residents, and support the health and sustainability of communities across the globe.

Program overview

Berkeley Deep Green Building incorporates best practices to:

1. **Support zero net energy** at the individual building and community scale
2. **Reduce embodied energy** in building materials and practices
3. **Reduce toxicity** in building materials
4. **Source sustainably produced materials** from fair trade, fair wage and culturally and environmentally sustainable suppliers; and
5. **Conserve water**.

Some of the components are similar to those in the US Green Building Council's LEED, Build It Green's Green Point Rated, and the International Living Future Institute's Living Building Challenge. However, Berkeley Deep Green while tied into California Codes and mandates for energy and water efficiency, is tailored to Berkeley with its limited rainfall and high urban density.

In addition, it acknowledges the latest science in environmental health and it looks holistically at a building's global warming impacts.

The program is intended to be voluntary and incentive-based at first, leading eventually to the adoption of new mandatory requirements, as appropriate.

The program's methods are to:

INSPIRE↦EDUCATE↦INCENTIVIZE↦EVALUATE & INCORPORATE

In addition to incentivized measures and eventual rules, Berkeley Deep Green Building includes a robust educational component, with outreach and programs for homeowners, contractors, architects, engineers, landlords, developers, lenders, appraisers, and members of the public.

Initially, Berkeley Deep Green Building applies only to residential buildings, including new buildings and remodeling projects over a specific size. This tracks the State's emphasis on residential buildings and reflects the complexities of devising regulations applicable to nonresidential enterprises with vastly different needs and uses, from offices full of computers to hospitals, grocery stores, factories and labs with equipment, heat, lighting, refrigeration and other specific needs that vary widely. In a later phase, the program will be extended to commercial, manufacturing and office buildings of all types.

Alignment with Berkeley and Statewide goals

Berkeley Deep Green Building helps implement Berkeley's 2009 Climate Action Plan, Berkeley's 2016 Resilience Strategy, the California Energy Commission's Title 24, and California's Zero Net Energy goals, and reflects the community's commitment to health, sustainability, and equity.

According to Berkeley's Climate Action Plan, commercial and residential buildings account for 53% of the city's GHG emissions. The first goal of the Plan is for "*new and existing Berkeley buildings [to] achieve zero net energy consumption through increased energy efficiency and a shift to renewable energy sources."* Clean and reduced energy use in buildings is also a key goal of Berkeley's Resilience Strategy.

The State of California, through Title 24, is continually increasing energy efficiency standards for buildings and is now preparing regulations for all new residential construction to be 'zero net energy' by 2020. Berkeley Deep Green Building supports achievement of the state's Title 24 and zero net energy goals.

The usage of natural gas represents 65% of Berkeley buildings' GHG emissions. Incentives to improve energy efficiency and shift from natural gas to electricity make the city's GHG reduction goals more attainable, especially if the proposed Alameda County Community Choice Energy project comes online, offering even cleaner electricity to Berkeley residents.

Technologies exist to support zero net energy in new construction and remodels, but not all building professionals are aware of these opportunities. New electric heat pumps for space and water heating are up to 30-40% [1] more efficient than gas furnaces. New materials for reducing air infiltration and requirements for increased insulation levels reduce the amount of space heating required. These measures, coupled with reduced plug loads, high-efficacy lighting, and solar hot water help to minimize electricity demand. Berkeley Deep Green Building incentivizes all of these, and more.

Program components

The Berkeley Deep Green Building program is offered in two Levels, providing a roadmap to achieve its goals. Initially, the program is envisioned as voluntary, with valuable incentives tied to compliance. Over time, voluntary components will be incorporated into the code, either at the state level or by the City of Berkeley. Since program goals are tied to California's long term energy goals, projects will be eligible for a number of energy efficiency incentives offered by the State as well as for incentives that the City of Berkeley may choose to offer.

Level 1 includes high-impact energy efficiency measures that generally are relatively easy to achieve, and addresses toxicity, responsible sourcing, and water use. Many of these measures dovetail with Title 24 and with state-level efforts to arrive at zero net energy. Incentives to achieve Level 1 standards should be substantial enough to induce most or all projects to comply. Level 2 standards reach further and are tied to additional incentives. In addition, not all components must be adopted to obtain incentives, though more comprehensive adoption will be more highly rewarded.

Each of the components listed below is discussed in more detail in **Appendix A.**

Berkeley Deep Green Building: Level 1

1. Above-code energy efficiency performance standard
2. Prescriptive energy efficiency measures
    a. 100% electric—no gas
    b. 100% high-efficacy lighting
    c. Best-in-class major appliances and equipment
    d. Switched outlets
3. State-defined 'solar ready' plus additional measures, where sufficient solar access exists
4. Cleaner insulation

[1] http://www.climaticva.com/electric-heat-pumps-vs-gas-furnaces/

   a. Insulation free of organohalogen flame retardants
   b. Low global-warming-potential insulation
5. Pre-remodel BESO assessment of home energy efficiency
6. Post-remodel energy, comfort, and air quality monitoring
7. Use of 100% Forest Stewardship Council (FSC)–certified sustainably harvested wood
8. Water conservation measures
   a. 100% extra-low-flow fixtures and appliances
   b. Water-permeable paving
   c. Water-conserving landscape (edible landscaping exempt)
   d. Laundry-to-landscape greywater and greywater-ready tub and shower plumbing

Berkeley Deep Green Building: Level 2

1. Energy efficiency performance standard higher than in Level 1
2. Reduced carbon footprint (embodied energy) of building
   a. Reduced concrete use (for hardscape and other nonstructural applications)
   b. Low-carbon-footprint concrete
   c. Wood in lieu of steel/concrete.
   d. Alternative and creative measures to reduce carbon footprint and to support responsible sourcing in a special, flexible category:
      i. Salvaged siding
      ii. Earth finishes
      iii. Fair trade/sustainably produced/green and fair labor–certified materials
      iv. Other high recycled content, locally sourced/produced and rapidly renewable materials
3. Installed solar photovoltaic (PV) system and/or solar thermal system sufficient to achieve zero net energy for the building, where sufficient solar access exists
4. Reduced toxicity through avoidance of Living Building Challenge Red List chemicals
5. Advanced water conservation measures
   a. Operational tub and shower greywater system
   b. Operational rainwater collection for non-potable domestic use

To learn more about each of the Level 1 and Level 2 measures, refer to **Appendix A**, which is organized in the same manner as the above lists.

Incentives

Over time, some or all of the incentive-based measures in Berkeley Deep Green Building may be incorporated into the building code, while new measures (which become available through industry innovations) can be included in the incentive-based program. For the program to be successful, incentives must be meaningful, motivating and easily understood. Specific incentives will be developed in collaboration with city staff.

Tools and motivators might include assistance with financing (permit fee rebates, low interest loans), relaxation of zoning requirements, bonuses, acceleration of permitting and inspection process, and/or public recognition through competitions, awards and PR events.

In addition, there are a number of local, state and federally sponsored incentives that may apply to projects. These include the following incentives and programs**.**

1. **Property Assessed Clean Energy (PACE)**

   Up to 100% financing of energy efficiency, water efficiency and renewable energy projects with little or no upfront costs, and payment through existing property tax bill. http://energycenter.org/policy/property-assessed-clean-energy-pace

2. **Bay Area Multi-Family Building Enhancements (BAMBE)**

   Cash rebates and free energy consulting for multifamily properties that undertake energy efficiency enhancements. http://bayareamultifamily.org

3. **Property tax exclusion for solar energy systems**

   Customers who install active solar systems such as solar water heaters and solar space heaters will not have their property tax re-assessed. (http://programs.dsireusa.org/system/program/detail/558).http://www.pv-tech.org/news/california_property_tax_exemptions_for_pv_systems_extended_to_2025

4. **Zero net energy pilot program by PG&E**

   Supports research, conducts workshops and outreach activities, and provides design and technical consultations to customers.

5. **Energy efficient mortgages (EEM)**

   The Federal Housing Agency's Energy Efficient Mortgages program helps families save money on their utility bills by enabling them to finance energy efficient improvements with their FHA-insured mortgage. The energy package is the set of improvements that the Borrower chooses to make based on the recommendations and analysis performed by a qualified home energy assessor. (http://portal.hud.gov/hudportal/HUD?src=/program_offices/housing/sfh/eem/energy-r)

6. **PG&E residential energy efficiency rebate program**

a. PG&E offers rebates to eligible residential customers who install energy efficient space conditioning systems and appliances. (http://programs.dsireusa.org/system/program/detail/1428)

b. A similar program is extended to multifamily residential buildings.

7. **PG&E California Advanced Homes (CAHP) incentives**
For builders of new homes, incentives are applicable to homes that display a 15% to 45% improvement over Title 24 2008 codes. Additional incentives are available when onsite solar PV systems are installed or to homes that display more than 40% improvement over Title 24 2013. http://cahp-pge.com/

Education and outreach

Education and outreach are key to the success of the Berkeley Deep Green Building program, ensuring that property owners as well as building, finance and regulatory professionals understand deep green building practices in general and their value to both the environment, and to the bottom line. Outreach is intended to inspire stakeholders to participate in the Berkeley Deep Green Building program, and can appeal to long term financial advantages (lower operating costs and increased desirability/rents/prices for super green and non-toxic buildings), concern for global warming and the welfare of future generations, and civic pride.

Targets for education and outreach will include homeowners, contractors, architects, engineers, landlords, developers, lenders, appraisers, property managers, city planners and staff, building inspectors, press and members of the public.

The education and outreach program might include:

1. Classes covering all measures included in the Berkeley Deep Green Building programs program, organized in collaboration with PG&E, Build It Green, Realtor Associations, the Berkeley Permit Service Center and/or Berkeley's Adult School
2. A citywide design competition for energy efficient building retrofits
    - Winners displayed at Permit Service Center or other locations
    - PR/media attention
    - Awards ceremony or recognition at a City Council meeting
3. Permit Service Center displays and brochures
4. Promotional items such as high-performing Smart Strips, low-flow WaterSense showerheads, etc.

Timeline for review

Energy efficiency measures, renewable energy production technologies and green, certified and non-toxic building materials are evolving rapidly. Berkeley Deep Green Building anticipates periodic review of program components by planning staff and stakeholders, every 2-3

years. Some program components may be incorporated into the building code as mandatory, while others can be modified, moved to a different Level or updated, and new components can be added. Mandatory periodic review builds in a mechanism for timely adoption of new materials, metrics and methods, as they become available and feasible. State-level changes can be incorporated as well, such as Title 24 updates. Finally, regular review will allow staff to evaluate the success of individual measures and to modify the program as appropriate.

Residential versus commercial

Berkeley Deep Green Building initially focuses on residential projects for several reasons. Commercial buildings are much more varied in their construction and use, requiring a more flexible set of goals. A manufacturing plant requiring 24/7 refrigeration or heat will have very different energy requirements from an office. An initial focus on residential energy efficiency is also consistent with the state's Long Term Energy Efficiency Strategic Plan, which targets zero net energy for all new residential construction by 2020 and for new commercial construction by 2030.

In the residential sector, recent technological changes enable dramatic improvements in energy performance and a shift to all-electric energy. Electric heat pump hot water heaters and new materials for reducing air infiltration have recently become commercially available, and PV prices have dropped significantly in the last 5 years. Commercial projects are addressed to some degree already under other City of Berkeley green building programs. Over time, commercial buildings can and should be incorporated in the program.

New construction and remodeling

Berkeley Deep Green Building components and incentives need to be tailored to new construction and remodels and various building types, i.e. single family, small multifamily and large multifamily. For remodels, thresholds will have to be established to determine when it would be appropriate for Deep Green features to be incorporated. City Staff are in the best position to consider what thresholds are feasible, and dovetail with other phased in requirements.

Berkeley Deep Green Building and other City, Regional and State programs

Berkeley Deep Green Building ties into other ambitious energy efficiency goals. These include:

1. **Building Energy Savings Ordinance (BESO)**

   BESO requires all building owners in Berkeley to complete an energy efficiency audit, helping them save energy and encouraging them to participate in various State-sponsored whole building programs. The assessment is carried out by qualified energy assessors who inform the building owners of incentives and rebates specific to the energy efficiency opportunities of the building.

2. **Title 24**

   Title 24 is a stringent, energy efficient, compulsory State building code. It is subject to triennial review and the requirements are revised based on available techniques and technologies. It is anticipated that Berkeley Deep Green Building will use the same metrics as those in force under Title 24, and that measures outlined in the Deep Green program will treat Title 24 as a baseline upon which Berkeley Deep Green Building will improve.

3. **Energy Upgrade California**

   Energy Upgrade California is a state program supported by CPUC, CEC, utility companies, non-profit organizations, small businesses, and various state agencies to help realize California's climate action and energy efficiency goals. It has a partnership with Energy Star to promote the use of energy efficient products and practices.

   This platform also informs home owners of the availability of incentives and rebates. Since it is anticipated that Berkeley Deep Green Building structures would be eligible for a number of incentives and rebates from the state and utility companies, Energy Upgrade California has the potential to encourage home owners to adopt Berkeley Deep Green Building and help realize California's climate action goals.

4. **California Long Term Energy Efficiency Strategic Plan**

   This plan was formulated in 2008 and adopted by CPUC as a single roadmap to achieve maximum energy efficiency in California. The goal of the plan is that all new homes will be zero net energy or zero net energy–ready by 2020. Similarly, Berkeley Deep Green Building encourages all new and existing homes in the City of Berkeley to rapidly become zero net energy.

5. **California Advanced Home Program (CAHP)**

   CAHP is a pay-for-performance whole building approach that aims to improve market demand for energy efficient single family and multi-family homes. It encourages builders of new homes to exceed Title 24 Part 6 by 15 to 45%. (New Residential Zero Net Energy Action Plan – pg. 14).

Appendix A

Level 1 and Level 2 components are explained in more detail below.

Berkeley Deep Green Building: Level 1

1) Above-code energy efficiency (performance component)

Establish robust ~~Site~~ site energy use intensity (EUI) maximums for various building types for new construction and remodels above a certain threshold size ~~consumption of 20 kBtu/ sq. ft. /yr for new construction and 25 - 30 kBtu/sq. ft. /yr for remodels above a certain threshold size without consideration of solar hot water or PV. .~~

Rationale: Studies consistently show that energy efficiency is the most cost effective and generally the most environmentally benign method of reducing GHG emissions. Mainstream technologies available now and common building techniques can easily and significantly reduce building energy usage. In many cases, the upfront costs of improving energy efficiency are recouped with energy cost savings in under 15 years.

A performance target allows for flexibility in reducing energy demand, through a combination of design strategies depending on the specifics of the project. The current average EUI of residential buildings in the Western states is about 40 KBtu/sq. ft. /yr site energy. Analysis performed by Arup and Davis Energy Group on how to achieve State energy use reduction goals shows that close to half of the average energy use can be eliminated through the standard palette of energy efficiency measures:

- Greater insulation.
- Considered placement of windows and addition of thermal mass to optimize passive solar gain and daylighting.
- High efficacy lighting and vacancy controls.
- Reduced plug loads.
- High efficiency appliances and heating equipment.
- Better air sealing.
- Energy efficient windows.

~~. Berkeley's initial target EUI is higher than t~~As an example, the current 2030 Challenge target EUIs for residential buildings in western states are ~~goal of~~ 15.4 to 19.1 kBtu/sq. ft. /yr site energy. The 2030 Challenge EUI maximums are set at increasingly lower levels each 5 years with a goal of zero for 2030. ~~However, t~~The 2030 Challenge allows for the inclusion of onsite generation of energy through solar hot water and PV in meeting the targets. For reference, the Passive House EUI maximum is 38 kBtu/sq. ft. /yr source energy. (This would b~~e~~e about 14.2 kBtu/sq. ft./yr if translated to site energy. In addition, the EUI target does include onsite PV offsets but only after a certain efficiency threshold has been met for the building envelope and solar hot water is included though as it is not related to envelope measures.) Finally, several cities and Architecture

2030, ~~with funding from the Rockefeller Brothers Fund~~under the umbrella of the Carbon Neutral Cities Alliance, are developing a metric for setting EUI targets that in the future may be appropriate for Berkeley.

~~The current average energy use intensity~~EUI ~~of residential buildings in the Western states is about 40 KBtu/sq. ft. /yr site energy. Analysis performed by Arup and Davis Energy Group on how to achieve State energy use reduction goals shows that close to half of the average energy use can be eliminated through the standard palette of energy efficiency measures:~~

- ~~Greater insulation.~~
- ~~Considered placement of windows and addition of thermal mass to optimize passive solar gain and daylighting.~~
- ~~High efficacy lighting and vacancy controls.~~
- ~~Reduced plug loads.~~
- ~~High efficiency appliances and heating equipment.~~
- ~~Better air sealing.~~
- ~~Energy efficient windows.~~

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Getting to Zero Carbon Buildings Sector, Rockefeller Brothers Fund, A meeting of City, State and Building Experts, March 14 - 16, 2016

2) Prescriptive energy efficiency measures on top of performance component

a) **All-electric.** ~~Concurrent with meeting energy efficiency performance standard outlined in component 1, building to receive all power from electricity. No gas line to be supplied to the site.~~Establish program to shift gas end uses in existing buildings ~~from gas~~ to electricity. New buildings to be all electric.

b) **100% high-efficacy lighting.** All lighting, both interior and exterior to be high efficacy, such as fluorescent or LED as per Title 24 2016 definitions.

c) **Best-in-class major appliances/equipment.** All new refrigerators, freezers, stoves, cooktops, dishwashers, washing machines, water heaters, and HVAC appliances must meet one of the following criteria:
   i) Energy Star Most Efficient, OR
   ii) CEE Tier 3, OR
   iii) Enervee 90+ (or whatever benchmark seems most comparable to the two above)

d) **Switched outlets.** At least one outlet in each room will be switched.

Rationale: The prescriptive energy efficiency measures are designed to both shift energy demand from fossil fuels to renewables and to reduce demand that is not easily addressed by the performance standards in component 1.

~~Requiring~~ Shifting homes to all-electric ~~homes~~ power allows for energy demand to be met with 100% renewables, either onsite or off. In the past, because of line losses and the inefficiency of turning fossil fuel energy into electricity, electricity delivered to the home represented 3 times as much embodied energy as fossil fuel. This is now changing as more and more PV and wind power generation comes online. Both the State's commitment to increasing the Renewable Portfolio Standard, and Berkeley's intention to migrate to cleaner energy sources through the Alameda County Community Choice Energy program are quickly shifting the power sources for electricity to clean renewables.

In addition, recent developments in heating and lighting technologies have dramatically improved the performance of many sources of electrical demand. Heat pumps are more than twice as efficient as the resistance heaters they are replacing. LEDs and fluorescent lights are as much as 10 times more efficient than incandescent and last over 5 times as long. By requiring use of these new technologies, electrical demand can be dramatically reduced.

In addition, tanked (heat pump) electric water heaters can be used for energy storage, helping to smooth the energy production/demand ("duck") curve.

Further reductions can be achieved by requiring best-of-class major appliances and switched outlets. Energy Star, administered by DOE, is the main program that evaluates and rates appliance energy efficiency. Appliance efficiency is determined based on specific parameters for each category:

- Television: Power consumption under various modes, display screen size
- Computer monitor: Power consumption under various modes, display screen size
- Clothes washer: Energy efficiency, water efficiency, capacity
- Dishwasher: Energy efficiency, water efficiency, size
- Refrigerator and freezer: Energy efficiency, volume
- Ventilation fans (Range hoods, bathroom and utility room fans): Efficacy, noise
- Ventilation fans (Inline fans): Efficacy

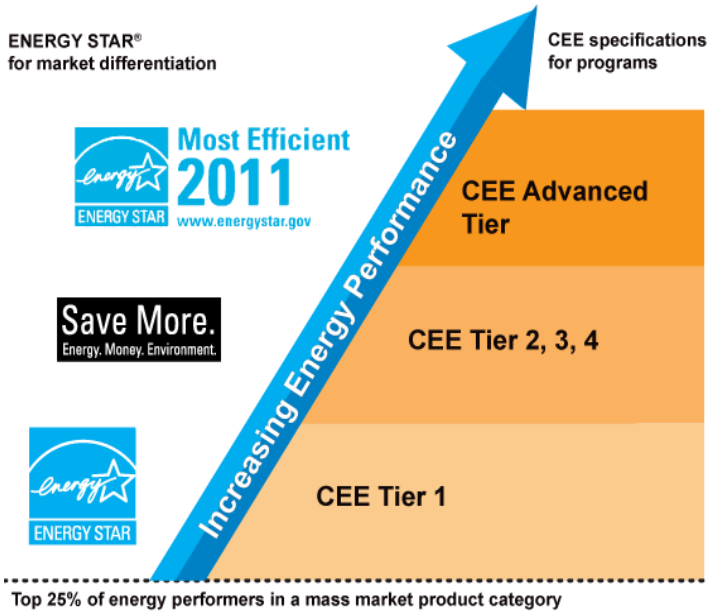
Energy Star Most Efficient is a program that identifies the most efficient Energy Star products in each category.

CEE (Consortium of Energy Efficiency) uses the Energy Star as a benchmark for various tiers:

- CEE Tier 1 is aligned with Energy Star program. Top 25% of models.
- CEE Tier 2, 3 and 4: Tiers above Energy Star minimum to be eligible for incentives. If incentives are offered, this is tied with Save More. Cost effective for customers with incentives.
- CEE Advanced Tier: Stretch targets. Attracts innovations. Top performance. Cost effective in future.

Enervee collects performance data for various appliances, and gives a score from 0 to 100 (the higher the score, the more efficient the product), for each product based on energy efficiency, other product-specific features, and cost. Enervee claims that the data and the scores are updated on a regular basis and presents the most accurate information based on market transformations.

Switched outlets will also enhance energy efficiency by allowing electronic equipment to be easily shut off completely. Many electronic devices draw a small current of electricity all of the time, even when they are not in use. These loads can be significant and while state and federal regulations should be promulgated that eliminate these ghost loads, providing users with a simple switch to turn them off will help in the meantime.



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Rachel Golden, The Role of Building Electrification in Achieving Long Term Climate Goals in the U.S, Prepared for NRDC, UC Berkeley Energy and Resources Group, June 2016

3) State-defined 'solar ready' plus additional measures, where sufficient solar access exists

Where sufficient solar access exists, provide the necessary components to make building solar ready as per Section 110.10 of the 2013 Building Energy Efficiency Standards (BEES), with the following additions, deletions and exceptions:

Photovoltaic (PV):

a) Main Service panel: if a 200A service, busbar must be 225A minimum with a 200A maximum main breaker; if 100A service, busbar must be 125A minimum with a 100A

maximum main breaker. There must be a reserved space in the panel for a double pole circuit breaker located at the opposite (load) end from the input feeder of the busbar.

b) No center-fed main service panels will be used.
c) Inverter location: minimum 3' wide unobstructed space (from ground to eave above) adjacent to the main service panel; include NEC required working clearance.
d) Module sizing and location: sufficient area for PV modules must be reserved which allows for the anticipated power needs to achieve a zero net energy home, plus the anticipated power needs for Electric Vehicle charging, where parking is provided or required. For a typical zero net energy home there should be space allocated for 10 kW of PV, and if there are additional power needs (such as an electric spa) that power need must also be taken into account. The reserved PV roof area shall be unobstructed and unshaded and facing between 110° to 270° from North: Minimum dimension of the reserved area to be 11' in the ridge-to-eave dimension, and assuming a power density of 15W/sf; allow for current fire code ridge and side clearances beyond the designated module areas (currently 3' to ridge and 3' clear on one side)
e) Clear and unobstructed pathway from the identified inverter location (preferably next to the main service panel) to the identified roof area.
f) OSHA approved fall arrest anchors installed at or near ridges; 5000 lb. capacity each, 8' maximum on center covering the designated module area.

Solar Thermal:

a) Solar water heater collector location: provide adequate unobstructed and unshaded roof area for an appropriate designated collector square footage on roof(s) facing between 110° (E) to 270° (W). Appropriate designated square footage shall be defined as 0.75 square feet per expected gallon-per-day (gpd) consumption for south facing pitched roofs or 1.5 square foot per expected gpd consumption for flat roofs. Area to be sized such that typical solar collector sizes can fit (no less than 4'x8' dimensions).
b) Designated location for solar storage tank. Size of storage capacity to be one gallon per gpd of expected daily use (i.e.: A single family home with an expected hot water consumption of 65 gallons per day per household would need a 65 gallon storage capacity). Designated location must be selected to minimize heat losses between hot water heater (within 5 feet of hot water heater or on the roof if ICS or thermosiphon is selected).
c) Minimum (1) 15A 120V receptacle on its own circuit within 5' of the solar storage tank location for solar water heating pumping and controls.
d) Minimum (1) 50A 240V circuit terminating within 5' of the water heater location for electric/heat pump water heater.
e) Solar water heater piping: either a chase of a minimum 12" x 12" dimension from within 5' of the storage tank location to a location even with or within 3' below the bottom of the designated solar collector location; or a pair of ¾" type M copper pipes plumbed and pressure tested to 100 psi from within 5' of the storage tank location to a location even with or within 3' below the bottom of the designated solar collector location.

f) Solar water heating conduit: provide a ½" EMT conduit with pull twine from the solar storage tank location to the roof exit location for solar control wiring. Seal the conduit against weather where it is exposed to the exterior.

g) Solar pool heating: Space must be allowed either on the roof or on the ground for a collector area that is 70% of the anticipated surface area of the pool, facing between 110° (E) to 270° (W). A pathway should be identified for (2) 2" pipes and (1) ½" conduit from the pool equipment area to the bottom of the designated solar collector location, and if feasible the pipe pathway should be sloped such that water could continuously drain back to the pool equipment area.

h) The above provisions are intended to be additive to the solar ready provisions of the existing BEES, except in those cases where they contradict, preclude or replace existing provisions, in which case these provisions supersede.

4) Cleaner Insulation

a) **Insulation free of organohalogen flame retardants.** No insulation used on the project can contain halogenated flame retardants.

b) **Low global-warming-potential insulation.** No insulation can have a lifetime global-warming-potential greater than .05/sq. ft.* R based on chart below developed by Building Green and the Inventory of Carbon & Energy (ICE), Version 2.0, by Prof. Geoff Hammond & Craig Jones

Rationale: Organohalogen flame retardants (sometimes also called halogenated flame retardants, or HFRs) are a class of chemical that is commonly used as flame retardants in polyurethane and polystyrene materials, including insulations. They are also found in some polyisocyanurate insulations. These chemicals have been linked to a host of serious health and developmental problems and also lead to the formation of toxic halogenated dioxins and furans in fires or during thermal processing (Shaw et al, 2010; US EPA 2014; Weber & Kuch, 2003; Ebert & Bahadir, 2003). Many are persistent and bioaccumulative. Building insulation, including disposal at end of useful life, is estimated to be a significant source of these chemicals in the environment (ECHA 2009). 22 chemicals have been banned internationally under the Stockholm Convention on Persistent Organic Pollutants: all are organohalogens, and one is commonly used in polystyrene insulation materials. The American Public Health Association has issued a policy statement calling for reduced use of these flame retardants to protect public health (APHA 2015).

Embodied energy is the measure of the energy that goes into harvest/extraction, manufacture and transport of a product. Reducing and minimizing the embodied energy of materials used in construction, reduces the carbon footprint of the buildings. Reducing the carbon footprint of buildings reduces GHG emissions at the start of a building's life, when they are needed most. Because of the delayed impact of GHGs and the self-reinforcing loops that GHGs trigger, reductions now are more significant than reductions in the future. By limiting the global-warming potential of insulation materials to .05/sq. ft./R, highly insulated buildings will 'pay back' the added carbon footprint of this extra insulation generally in 5 years at most. The only insulations

that currently don't meet this standard are extruded polystyrene and closed-cell spray polyurethane.

Because of the chemicals commonly used to expand the foam, extruded polystyrene and closed cell spray polyurethane have an extremely high lifetime global-warming potential. In a 2010 study by Buildinggreen.com ("Avoiding the Global Warming Impact of Insulation," by Alex Wilson, Environmental Building News, Vol 19.6), the payback from using extruded polystyrene and closed-cell spray polyurethane foam as an additional insulation layer on the outside of a 2 x 6 framed and insulated house was a minimum of 30 years for a house in a very cold climate like Boston. With less than half of the heating and cooling loads of Boston, the payback time in Berkeley for a similar house would be a lot longer.

Another study by Passive House researcher Rolf Jacobson, shows payback periods of 20+ years from using these high global-warming-potential insulations to meet Passive House energy efficiency goals. ("Comparing 8 Cold Climate PH Houses," by Mary James, Home Energy Magazine, Oct. 2014)

Manufacturers are developing safer alternative methods of expanding the foam.

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Lifetime Global Warming Potential of Insulations

Insulation Material	R-value R/inch	Density lb/ft³	Emb. E MJ/kg	Emb. Carbon $kgCO_2/kg$	Emb. Carbon $kgCO_2/ft^2 \cdot R$	Blowing Agent (GWP)	Bl. Agent kg/kg foam	Blowing Agent GWP/ bd-ft	Lifetime GWP/ $ft^2 \cdot R$
Cellulose (dense-pack)	3.7	3.0	2.1	0.106	0.0033	None	0	N/A	0.0033
Fiberglass batt	3.3	1.0	28	1.44	0.0165	None	0	N/A	0.0165
Rigid mineral wool	4.0	4.0	17	1.2	0.0455	None	0	N/A	0.0455
Polyisocyanurate	6.0	1.5	72	3.0	0.0284	Pentane (GWP=7)	0.05	0.02	0.0317
Spray polyurethane foam (SPF) – closed-cell (HFC-blown)	6.0	2.0	72	3.0	0.0379	HFC-245fa (GWP=1,030)	0.11	8.68	1.48
SPF – closed-cell (water-blown)	5.0	2.0	72	3.0	0.0455	Water (CO_2) (GWP=1)	0	0	0.0455
SPF – open-cell (water-blown)	3.7	0.5	72	3.0	0.0154	Water (CO_2) (GWP=1)	0	0	0.0154
Expanded polystyrene (EPS)	3.9	1.0	89	2.5	0.0307	Pentane (GWP=7)	0.06	0.02	0.036
Extruded polystyrene (XPS)	5.0	2.0	89	2.5	0.0379	HFC-134a[1] (GWP=1,430)	0.08	8.67	1.77

1. XPS manufacturers have not divulged their post-HCFC blowing agent, and MSDS data have not been updated. The blowing agent is assumed here to be HFC-134a.

http://www.greenbuildingadvisor.com/blogs/dept/energy-solutions/avoiding-global-warming-impact-insulation

5) Pre-remodel BESO assessment of home energy efficiency.

Submit paperwork from BESO assessment with permit application for remodel.

Rationale: BESO requires building owners to complete an energy performance assessment and publicly report the building performance information via an electronic reporting interface controlled by the Director of Planning and Community Development or their designee. Energy assessment is carried out by registered energy assessors who provides recommendations to improve the energy performance of the building. For BESO energy assessment one of the following is required:

a) Home Energy Score: Home Energy Score is developed by LBNL and rates homes on a scale of 1 to 10, 10 indicating excellent energy performance. Home energy Score includes the score, energy use breakdown, data collected and recommendations to improve energy performance.
b) Energy Upgrade California (EUC) Advanced Assessment: Home Upgrade has a network of qualified energy assessors in the bay Area who can assess homes and identify opportunities for energy performance improvement.
c) High Performance: If a qualified energy upgrade has been completed or if the building is already very energy efficient, the owner can submit evidence of these upgrades or this efficiency in lieu of the BESO audit.

The BESO assessment informs owners on the building's energy performance and provides a roadmap for improvement. Assessments are carried out by registered assessors using advanced diagnostic tools. While encouraging them, the system makes it voluntary to incorporate performance improvement measures. Reducing one's carbon footprint, improving comfort in the house and saving on energy bills are all incentives for building owners to carry out recommended changes. Improved marketability of energy efficient residences is a further incentive to owners to implement recommended energy conserving measures.

6) Post remodel energy, comfort, and air quality monitoring (operational rating)

a) For a period of one year following completion of construction, monitoring will be carried out for the following parameters: hot water use, appliance loads, space heating loads, interior temperature, relative humidity and CO2 levels. Consider requiring entry of projects as case studies into the NZEC-NESEA inventory, for which all case studies are QA'd by NREL before publishing.

b) Project must document energy use meets target expectations to be eligible for incentives from the City.

c) Monitoring data will be included in a public database (that protects privacy) and compared to pre-construction projected energy use in bi-annual reports. Reporting could potentially be less frequent if incorporated into NZEC-NESEA inventory.

Rationale: The intention of Berkeley Deep Green Building is to radically improve the comfort, performance and indoor air quality of buildings throughout the City of Berkeley. However, without a means to track these improvements, it may not achieve the outcomes required to reduce our global carbon emissions. Therefore, the program includes a mandatory monitoring for all participants. A list of devices for tracking both energy performance and indoor air quality are included below.

Bi-annual reports examining the data will help to direct future improvements to Berkeley Deep Green Building.

Energy Use Monitoring Systems:				
Name	Website	Cost	#circuits	Cost/circuit
eGauge EG3010 (Residential)	http://www.egauge.net/	$544	12	$45.33
eGauge EG300 (commercial)	http://www.egauge.net/	$494.00	12	$41.17
SiteSage	http://powerhousedynamics.com/	tbc	44	
PowerSave Envi	http://www.currentcost.net/	$129	10	$12.90
Lgate	http://locusenergy.com/	tbc	2	
EnergyCloud	http://bluelineinnovations.com/	$89	1	$89.00
TED 5000	http://www.theenergydetective.com/	$199.00	1	$199.00
TED Pro Home	http://www.theenergydetective.com/	$300.00	32	$9.38
Wattvision	http://www.wattvision.com/	$99.00	1	$99.00
(Highlighted cells are the ones that look most viable and informative for tracking home energy use)				
IAQ Monitoring Systems:				
Foobot	http://foobot.io/	$199.00		
Elgato Eve Room	https://www.elgato.com/en/eve/eve-room	$75.00		
Netatmo Home Weather Station	https://www.netatmo.com/	$148.00		
			updated:	3/2/2016

http://www.homepower.com/articles/home-efficiency/electricity/tracking-your-energy-use

7. FSC-certified wood

FSC-certified wood and wood products are to be used when available.

Rationale: FSC is an independent member-led group that advocates use of wood sourced from sustainably managed forests (see us.fsc.org/en-us). FSC-certified wood aligns with the Berkeley Deep Green Building requirement for sustainably sourced materials and offers the following benefits:

- FSC standards for forest management discourages harvesting wood from old-growth forests, thus preventing loss of natural forest cover.
- The standards extend to protection of water bodies and prevention of use of hazardous chemicals, such as Atrazine, that are otherwise allowed in the US.
- FSC requires forest managers on both private and public lands to involve the local community and protect indigenous people. It requires the local community to be part of the decision-making on impacts of operations and certification.
- FSC audit reports on public and private lands are available to the public.

FSC wood and wood and cabinetry and windows made with FSC wood are available from many local sources. A list of these sources, updated annually, is available from the Ecology Center on San Pablo Ave.

Note: the SFI certification is not a comparable alternative and cannot be used as a substitute certification program.

8. Water Conservation

All new plumbing fixtures to be 100% extra-low flow fixtures and appliances.

Fixture	**Flow rate mandated by California Energy Commission (gpm)**	**Maximum flow rate recommended by Berkeley Deep Green Building (gpm)**
Faucet	1.2	.5
Shower	-	1.25
Kitchen Faucet	1.8 that can be increased to 2.2	1.8 (for functional reasons such as pot filling)
Toilets	1.28	1

Permeable paving. Maximize permeable paving. Paving materials such as gravel, pervious concrete or asphalt, spaced paving blocks, loose materials, or tire spurs allow storm water to percolate and infiltrate into the ground, allowing for groundwater recharge and reduction in runoff and flooding. When choosing a permeable paver, consider Americans with Disabilities Act (ADA) access requirements and the anticipated vehicular load in hardscape areas. Areas with very high traffic or very heavy anticipated loads may not be suitable for pervious paving strategies. Examples of permeable paving are: Pervious concrete or asphalt, an open-grid pavement system with at least 50% permeability, permeable materials, such as gravel, decomposed granite, or sand.

Water conserving landscape. Post construction landscape design shall be designed to achieve the following:

1. Areas disrupted during construction are restored to be consistent with native vegetation species and patterns.

2. Limit Turf areas to 10 percent of the total landscaped area.

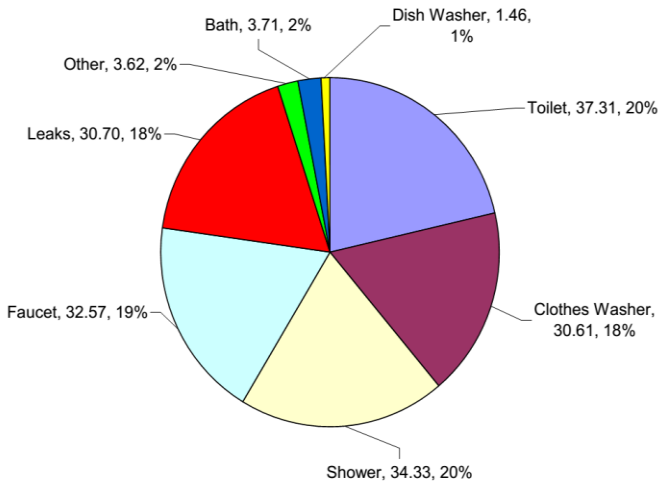
3. Utilize at least 75 percent native California or drought tolerant plant and tree species appropriate for the climate zone region. Areas devoted to edible landscape exempt because of importance of localizing food supply.

4. Plants to be hydrozoned by water needs.

Laundry-to-landscape greywater and greywater-ready tub and shower plumbing. Install laundry to landscape greywater system. New showers and tubs to be plumbed to be greywater ready: i.e. greywater piping kept separate from black water piping in such a fashion as to provide easy access for diversion into a greywater system at a future date.

Rationale: It is estimated that the average resident in Northern California uses 171 gallons per day for indoor use and 125 gallons per day for outdoor use. It is also estimated that residents of the Bay Area use less than 171 gallons of water for indoor use (California Single Family Water Use Efficiency Study, 2011).

The following chart presents a perspective on the average residential water use in California.



A state of emergency was declared in California in 2014 due to drought conditions. Record low precipitation in 2014 affected drinking water reserves in the state. Precipitation in subsequent years has not been enough to bring California out of the drought situation. This emergency prompted the State to take corrective actions and make the water efficiency standards in buildings and in agricultural practices more stringent. It is imperative that all new and existing

buildings honor this commitment by the State. The water efficiency goals of the Berkeley Deep Green Building program will be in line with the State's commitment and requirements.

Water-permeable paving allows infiltration of rainwater into the ground and helps recharge ground water. It prevents excess storm water runoff that overloads the capacity of our wastewater treatment plants (where there are combined sewer and stormwater systems). Additionally it filters pollutants from runoff thus improving the quality of storm water runoff and preserves ground water quality.

Limiting turf area conserves water as turf has high irrigation needs. Native turf varieties are recommended instead because of their lower irrigation needs. Limiting turf area will allow the owner to explore alternate irrigation options such as drip irrigation which work well with other landscaping species

More efficient irrigation can be achieved by clumping species with similar irrigation needs together in the landscape.

Re-use of greywater for landscape irrigation has been estimated to offset from 16 to 40% of municipal potable water use.

Laundry-to-landscape greywater systems are easy to install, economical, and do not require a permit so long as explicit guidelines are followed.

Tub/shower greywater can readily be diverted for re-use in the landscape so long as the drainage piping is accessible and there is adequate space in the piping to install a backwater valve and diverter valve. If not anticipated with the installation of "greywater ready plumbing", it can become cost prohibitive in the future to attempt to capture that greywater for re-use. Where a new tub/shower is situated on a slab, the drain piping can be routed to an area (even outside the building footprint) where access can be provided before it joins black water drain piping. Similarly, upstairs tub/showers can have drainage piping extend into lower walls or the crawlspace to provide that access, before combining with black water piping.

Ideally, landscaping would be designed to optimize greywater re-use from various sources in the home using the least expensive types of greywater irrigation systems.

References:

Stormwater fact sheet.pdf by Bay Area Stormwater Management Agencies Association

California Code of Regulations Title 23, Division 2, Chapter 2.7. Model Water Efficient Landscape Ordinance. (https://govt.westlaw.com/calregs/Document/I8403E54417874B8B94843C8A8341823B?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=(sc.Default)&bhcp=1)

DWR offers rebates to replace turf with other native species. (http://www.saveourwaterrebates.com/turf-replacement-rebates.html)

Berkeley Deep Green Building: Level 2

1. Higher above code energy efficiency (performance component)

Establish even lower energy use intensity maximums than tier 1
~~nergy use intensity (EUI) maximum of 14 kBtu/ sq. ft. / yr site energy~~ for both new construction and remodels above a certain threshold in size. See item 1. above for rationale.

2. Reduced embodied energy (prescriptive measures)

a. **Reduce concrete use (reduce concrete use for hardscape and other nonstructural applications).** Consider prohibition on use of materials high in embodied energy such as ~~N~~new concrete and kiln-fired brick, pavers, etc., ~~cannot be used~~ for non-structural ~~purposes and should not be used in excessive amounts for structural~~ purposes.

b. **Low embodied-energy concrete.** Specify concrete with global-warming potential 30% or more below standard mixes as established by the NRMCA.

"Supply concrete mixtures such that the total Global Warming Potential (GWP) of all concrete on the project is 30% or more below the GWP of a reference building using Benchmark mixes as established by NRMCA and available for download at www.nrmca.org. Submit a summary report of all concrete mixtures, their quantities and their GWP to demonstrate that the total GWP of the building is 30% or more below the GWP of the reference building. Contractor may use the Athena Impact Estimator for Buildings software available at www.athenasmi.org or other similar software with the capability of calculating GWP of different mix designs."

c. **Wood in lieu of steel/concrete:** Where it is possible to substitute, wood (including~~,~~ cross-laminated timber and other engineered wood products) will be used in lieu of concrete and steel structural systems.

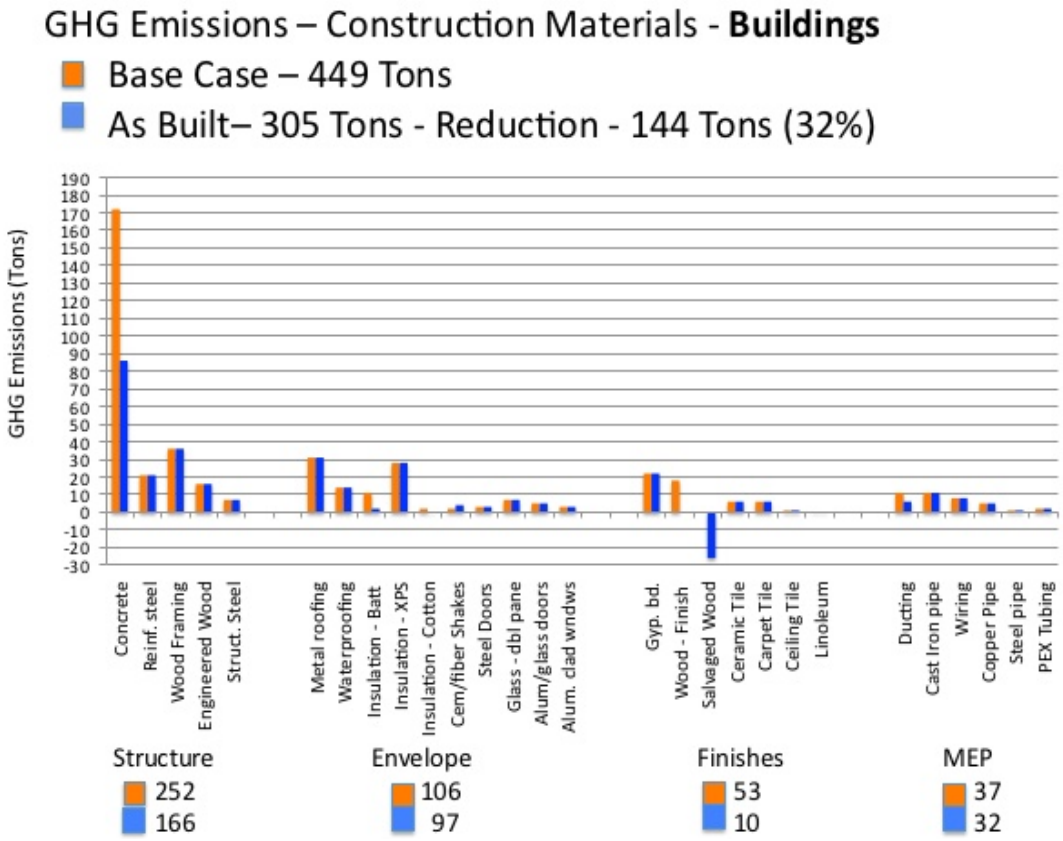
d. **Petition for consideration of alternative measures for reducing embodied energy. For example, salvaged siding, earth finishes, high recycled content, locally sourced, ~~and~~ rapidly renewable materials, and remodeling rather than constructing new.**

Rationale: As operational energy goes down, the significance of energy embodied in materials increases. Currently over a buildings whole life, embodied energy accounts for roughly 20% of a building's total GHG footprint. However, in the first 20 years of a building's life, this can be 50% or more. In addition, as we approach zero net operating energy, these numbers increase, eventually reaching 100%.

Low-carbon materials provide net GHG emissions reductions now, when GHG emissions reductions are most effective and are needed most because of the delayed impact of GHGs and the self-reinforcing loops that GHGs trigger.

Low-carbon construction can reduce the embodied energy of a typical building by 30 to 50%, with 20% achieved through simple substitutions.

Rapidly renewable plant materials, wood, earth and stone are the primary low-carbon construction materials. Use of rapidly renewable plants and wood products actually sequesters atmospheric carbon and could be assembled to create a carbon negative house. Metal and plastics in general have a very high carbon footprint and should be avoided where possible. Concrete, while lower in embodied energy per pound, is used in such great quantities that its global warming impact tends to dwarf that of other materials used in construction. A detailed analysis of the embodied energy of a building recently designed by Siegel and Strain Architects shows the relative significance of various components:



Berkeley Deep Green building focuses on reducing concrete in nonstructural uses because there are many good low-carbon alternatives. It encourages use of wood instead of concrete and steel structurally because structural systems contribute most to a building's overall embodied energy. Where concrete is essential structurally, many methods exist to reduce the embodied energy of concrete significantly without compromising its performance.

Finally, where wood is use mainly for the structure, advanced framing techniques can be employed that can reduce the amount of lumber used by up to 25%. Advanced framing components include:

- Framing walls with studs at 24" on center.
- Designing windows and doors on the plywood/sheetrock module
- Single top plates instead of double top plates
- Single stud at window
- No headers over doors and windows in nonbearing walls
- No cripple under windows
- Hang window and door headers instead of using Jack studs
- Use only 2 studs for corners

Additional information about this construction technique is available in **Efficient Wood Use in Residential Construction: A Practical Guide to Saving Wood, Money, and Forests** by Ann Edminster and Sami Yassa, 1998. Natural Resources Defense Council

References:

"Greenhouse Gases and Home Building: Manufacturing, Transportation, and Installation of Building Materials," by Warren Carnow, National Home Builders Association, September 2008 http://www.nahb.org/en/research/housing-economics/special-studies/archives/greenhouse-gasses-and-home-building-2008.aspx

Lessons Learned from Recent LCA Studies, SEAOC 2013 Convention Proceedings, by Frances Yang

SEAOC LCA Study: Comparing Environmental Impacts of Structural Systems, SEAOC 2013 Convention Proceedings, by Anthony Court, Lisa Podesto, Patti Harburg-Petrich

http://www.usda.gov/wps/portal/usda/usdamediafb?contentid=2011/09/0426.xml&printable=true&contentidonly=true

Science Supporting the Economic and Environmental Benefits of Using Wood and Wood Products in Green Building Construction, y Michael Ritter, Kenneth Skog, and Richard Bergman, USDA, Forest Products Laboratory, GTR FPL-GTR-206, page 4 http://www.fpl.fs.fed.us/documnts/fplgtr/fpl_gtr206.pdf

http://www.woodworks.org/why-wood/

http://www.rethinkwood.com/

"Clock is Ticking," by Larry Strain, greensourcemag.com, May/June 2011, http://www.siegelstrain.com/site/pdf/201105_ClockisTicking-LStrain.pdf

http://archpaper.com/2016/04/time-to-experiment-anew-david-benjamin-on-embodied-energy-and-design/#gallery-0-slide-0

http://apps1.eere.energy.gov/buildings/publications/pdfs/building_america/26449.pdf

http://www.apawood.org/data/sharedfiles/documents/m400.pdf

http://www.usahers.com/pdffiles/VEFraming1-17-01.pdf

3. Solar photovoltaic (PV) system and/or a solar thermal system sufficient to achieve zero net energy for the building, where sufficient solar access exists

Where sufficient solar access exists, install a solar PV and/or solar thermal system, sized as required to achieve zero net energy for the building, including excess inverter capacity for expansion.

Photovoltaics: The PV system shall be sized to offset 100% of on-site electrical loads, and in addition shall include either 1) inverter capacity for the PV modules needed to supply power for at least 2 EVs which travel 30 miles per day round trip, or 2) adequate space and breaker capacity at the main service panel to add this inverter capacity later. If the system uses micro inverters then no added inverter capacity is required. Prioritize usage of roof areas which have a 90% or greater annual solar access; if those areas prove insufficient, utilize areas with not less than a 70% solar access. System sizing should be done using one of the nationally accepted solar calculator tools, such as PVWatts, PVSyst, Helioscope, and SAM.

Solar thermal: A solar thermal system will typically offset between 50% and 70% of a residence's annual hot water loads. If the building design indicates a need for solar thermal to achieve zero net energy, then the system must be installed in a way that achieves a minimum 50% solar fraction. Any SRCC OG300 certified system may be used; however, if the system involves hot water storage on the roof then the roof structural design must be proven adequate to carry the additional load. If there is going to be a swimming pool on the property there should also be an adequately sized unglazed or glazed solar pool heating system.

4. Reduced toxicity through avoidance of Living Building Challenge Red List chemicals

Projects cannot use products that contain chemicals on the Living Building Challenge Red list. These chemicals are:

- Alkylphenols
- Asbestos
- Bisphenol A (BPA)
- Cadmium
- Chlorinated Polyethylene and Chlorosulfonated Polyethlene
- Chlorobenzenes
- Chlorofluorocarbons (CFCs)
- Chloroprene (Neoprene)

- Chromium VI
- Formaldehyde (added)
- Halogenated Flame Retardants (HFRs)
- Hydrochlorofluorocarbons (HCFCs)
- Lead (added)
- Mercury
- ~~Petrochemical Fertilizers and Pesticides~~Polychlorinated Biphynels (BCPs)
- Perfluorinated Compounds (PFCs)
- Phthalates
- Polyvinyl Chloride (PVC)
- Polyvinylidene Chloride (PVDC)
- Short Chain Chlorinated Paraffins
- Wood treatments containing Creosote, Arsenic or Pentachlorophenol
- Volatile Organic Compounds (VOCs) in wet-applied products (above specified amounts)

The International Living Future Institute, which manages the Living Building Challenge, grants temporary exceptions for many Red List Chemicals owing to current limitations in the materials economy. These same exceptions, as outlined in the Living Building Challenge 3.0 Materials Petal Handbook, shall apply in Berkeley Deep Green Building. However, no exceptions shall be made for halogenated flame retardants (HFRs) in insulation given the availability of alternative materials that do not contain HFRs.

Rationale: The International Living Future Institute has assembled a list of chemicals it identifies as the "worst in class" materials, chemicals, and elements known to pose serious risks to human health and the greater ecosystem." Ultimately, they should be phased out of production because of toxicity concerns. A growing body of research is demonstrating the role of chemical pollutants in the development of a broad array of childhood and adult diseases (e.g. neurodevelopmental disabilities, asthma, allergies, psychiatric disorders, immune deficiencies, birth defects, cancers, diabetes, endometriosis, infertility, and Parkinson's disease). The time of greatest vulnerability is during pregnancy, when minute exposures to the fetus during critical developmental windows can set a child up for a lifetime of chronic illness.

Unfortunately, there is very little federal regulation to ensure the safety of the >85,000 synthetic molecules developed since WWII. When Toxics Substances Control Act (TSCA) was passed in 1976, 62,000 chemicals were simply grandfathered in as being permissible to use in commercial products. Of the 20,000 plus new chemicals developed since then, health data has been generated on only 15% of them. Since the passage of TSCA, the EPA has outlawed only 5 chemicals under this law.

Building consumes 40% of raw materials globally (3 billion tons annually) and therefore contributes substantially to the extraction, manufacture and use of materials in our environment. Avoidance of building products containing ILFI Red List Chemicals helps to create safe environments in our homes and redirects manufacturing to a more sustainable future.

References:

www.greensciencepolicyinstitute.org

www.braindrain.dk

http://jama.jamanetwork.com/article.aspx?articleid=185391

http://www.healthandenvironment.org/about/consensus

http://arjournals.annualreviews.org/e...

https://www.youtube.com/watch?v=E6KoMAbz1Bw Little Things Matter by Bruce Lanphear, MD, Prof at Simon Fraser University, Published on Nov 11, 2014

5. Advanced Water Conservation Measures

a. **Operational tub and shower greywater system**. Direct all shower/tub water to permitted outdoor greywater system.

b. **Operational rainwater collection for non-potable domestic use.** A minimum 1000 gallon rainwater system to be installed for use for toilets and/or laundry.

Rationale:

California enacted the Rainwater Recapture act in 2012 which allows residents to capture and use rainwater collected onsite. There are many benefits to capturing and reusing rainwater onsite:

- Rainwater use offsets the demand on the potable water supply which is under a great strain because of the State's drought conditions.
- While the individual capacities of rainwater barrels or cisterns are inadequate for agricultural or industrial purposes, they are adequate for residential non-potable applications. If every home in the City of Berkeley collected and used rainwater, at the minimum for outdoor irrigation, the water saved in the reservoirs could be diverted to other applications that do not offer much flexibility, such as agricultural and industrial applications. Consequently this relieves the demand on the potable water supply.
- Rainwater is a free and clean source for irrigation. It is low in sodium and chloramine and is fluoride free.
- Additionally, basic filtration and treatment makes rainwater fit for other uses such as toilet flushing and cleaning laundry (subject to permitting requirements).
- Capturing rainwater reduces the speed of flow in storm water systems and into the Bay. This helps in preventing changes in the local ecosystem.

Greywater is lightly used water from tubs, showers, sinks and clothes washers: so long as care is taken in the choice of cleaning products it can be effectively re-used for outdoor irrigation.

Using municipal water twice lowers the embodied energy/carbon footprint per use, reducing the chemicals and costs involved in treating water initially to potable standards and later in treating it before release back into the environment.

Fortunately there are many systems available ranging in price and suitability for different types of landscapes. The simplest and least expensive sends the greywater directly to the garden as it is produced, via gravity or using the pump already in the washing machine. Mulch basins in the landscape allow the greywater to infiltrate into the soil, and are best suited for irrigating larger trees, shrubs, vines, perennials.

More expensive systems utilize tanks, pumps, filtration and sophisticated controls in order to distribute the greywater in regulated amounts through special drip tubing. Some require that the homeowner clean the filters, others provide automatic back flushing of filters using potable water (with cross connection protection) or air.

There are even specialized greywater systems that can be installed under turf. Other whole house systems gather the greywater, treat it onsite to the NSF 350 standard so that it is no longer technically greywater, and utilize it for toilet flushing.

It is wise to anticipate the desired type of system (and budget) and design/plumb accordingly—some systems require space for necessary equipment to be installed, either indoors or out, and require that all greywater piping lead to one location.

Even if there is no plan to implement a system, installing plumbing to be 'greywater ready' is a courtesy to all future owners of the property when greywater re-use may be mandatory.

Currently all systems require a permit except the laundry-to-landscape system, which must abide by code-specified guidelines to be exempt.

References:

The Water Wise Home, by Laura Allen, Storey Press, 2015

Stormwater fact sheet.pdf by Bay Area Stormwater Management Agencies Association

http://www.ci.berkeley.ca.us/Planning_and_Development/Energy_and_Sustainable_Development/Rainwater_Harvesting.aspx

Ideas from community input session 06.14.2016

Level 1

1. Bike parking to be included in both new and existing homes
2. Clause to be added on EUI with respect to number of bedrooms.
3. Carbon sequestration (need more inputs on how this can be achieved without cluttering the program). One is encourage residents to separate recyclables, composting and landfill trash, similar to what is done in San Francisco. (http://sfenvironment.org/zero-waste/recycling-

and-composting/residential-recycling-and-composting) However, not sure if this accounts to carbon sequestration.

4. Secondly under carbon sequestration, we could add construction waste recovery and recycling, which requires collecting construction waste and sending all recyclable waste to authorized recyclers and / or send reusable materials to other construction sites. This is to minimize waste going to landfills. This is similar to the measures in LEED.

Level 2

1. Incorporate EV charging points in all multifamily homes and newly constructed single family homes
2. Reduce number of parking spaces in homes within 0.25 miles of public transit.

Berkeley DEEP GREEN Building

Promoting Sustainable Building Practices to advance Berkeley's Climate Action and Resiliency Goals

This proposal was conceived and prepared by the

Berkeley Zero Net Energy++ Working Group

A group of citizens and building professionals dedicated to making Berkeley's Building Code a model of green, non-toxic, sustainable building practices and achieving Berkeley's Climate Action Plan and Resilience Strategy goals by inspiring, educating and supporting the community

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Executive Summary

Many new residential developments have been approved in the City of Berkeley in recent years, and even more are in the pipeline. At the same time, existing buildings comprise the vast majority of Berkeley's building stock. Most of these buildings, existing and new, consume excessive energy and water.

While many new projects have the benefit of being sited on transit corridors, they often fall short of their full potential to reduce environmental impacts because they do not incorporate best practices for Green Building. Berkeley's recently adopted Building Energy Savings Ordinance (BESO) helps identify potential energy conservation measures, but does not provide incentives and specific guidance to support homeowners, builders and developers in meeting Environmental and Greenhouse Gas (GHG) reduction goals.

Berkeley Deep Green Building proposes an incentive-based path towards buildings that meet Berkeley's environmental and GHG reduction goals, protect the health and safety of Berkeley workers and residents, and support the health and sustainability of communities across the globe. The program is intended to be voluntary and incentive-based in the beginning, leading to the adoption of mandatory measures in later stages. In line with the vision of California's Long Term Energy Efficiency Goals, the program would initially focus on the residential sector, to help achieve the State's 2020 residential sector energy goals. Over time, Berkeley Deep Green Building would incorporate measures for the non-residential sector, aligning with the State's 2030 targets for non-residential structures.

Berkeley Deep Green Building ties into Berkeley's Climate Action Plan and BESO, and into State codes and other programs such as Title 24, Energy Upgrade California and the California Advanced Home Program. In addition to new incentives to be provided by the City of Berkeley, homeowners, builders and developers participating in Berkeley Deep Green Building would be eligible for a number of incentives already offered by the State and PG&E.

Berkeley Deep Green participation would be offered in two Levels. Level 1 includes high impact sustainability measures that address energy efficiency, toxicity, responsible sourcing and water use. These measures are the easiest to achieve and tie into Title 24 and other State-level efforts to arrive at Net Zero Energy. Level 2 measures are more stringent and offer greater impact in achieving environmental and GHG reduction goals. Berkeley Deep Green is intended to encourage/incentivize most projects to comply with Level 1, while further incentivizing/rewarding Level 2 projects to take on the highest levels of environmental stewardship.

Berkeley Deep Green Building would not only help to achieve Berkeley's environmental and GHG reduction goals but can also be a model for other cities to follow, helping to achieve long term sustainability goals in communities across the United States, and around the globe.

Table of Contents

Introduction

Berkeley is building again. Over 2000 new units have been approved in the past 3 years, and many are under construction. Another thousand are in the pipeline—with more sure to come. Many of these new developments are on or near major transit corridors, qualifying them as 'transit-oriented development', which is environmentally preferable to development that is dependent on automobiles.

But while reducing dependence on automobiles is an important goal, transit-oriented development falls short of its potential when buildings themselves use excessive energy and water over their lifetimes or are built with energy intensive, toxic and/or unsustainably produced materials.

At the same time, existing structures form a sizeable percentage of Berkeley's building stock. Berkeley's recently enacted Building Energy Savings Ordinance (BESO) requires all home owners to audit their home performance and will help—over time—to identify energy efficiency improvements for existing buildings. However, there are few incentives to implement improvements and little guidance on how to prioritize work to best support climate change goals.

Berkeley Deep Green Building is a proposal for an incentive-based path toward buildings that meet Berkeley's environmental and greenhouse gas (GHG) reduction goals, protect the health and safety of Berkeley workers and residents, and support the health and sustainability of communities across the globe.

Program overview

Berkeley Deep Green Building incorporates best practices to:

1. **Support zero net energy** at the individual building and community scale
2. **Reduce embodied energy** in building materials and practices
3. **Reduce toxicity** in building materials
4. **Source sustainably produced materials** from fair trade, fair wage and culturally and environmentally sustainable suppliers; and
5. **Conserve water**.

Some of the components are similar to those in the US Green Building Council's LEED, Build It Green's Green Point Rated, and the International Living Future Institute's Living Building Challenge. However, Berkeley Deep Green while tied into California Codes and mandates for energy and water efficiency, is tailored to Berkeley with its limited rainfall and high urban density.

In addition, it acknowledges the latest science in environmental health and it looks holistically at a building's global warming impacts.

The program is intended to be voluntary and incentive-based at first, leading eventually to the adoption of new mandatory requirements, as appropriate.

The program's methods are to:

INSPIRE↦EDUCATE↦INCENTIVIZE↦EVALUATE & INCORPORATE

In addition to incentivized measures and eventual rules, Berkeley Deep Green Building includes a robust educational component, with outreach and programs for homeowners, contractors, architects, engineers, landlords, developers, lenders, appraisers, and members of the public.

Initially, Berkeley Deep Green Building applies only to residential buildings, including new buildings and remodeling projects over a specific size. This tracks the State's emphasis on residential buildings and reflects the complexities of devising regulations applicable to nonresidential enterprises with vastly different needs and uses, from offices full of computers to hospitals, grocery stores, factories and labs with equipment, heat, lighting, refrigeration and other specific needs that vary widely. In a later phase, the program will be extended to commercial, manufacturing and office buildings of all types.

Alignment with Berkeley and Statewide goals

Berkeley Deep Green Building helps implement Berkeley's 2009 Climate Action Plan, Berkeley's 2016 Resilience Strategy, the California Energy Commission's Title 24, and California's Zero Net Energy goals, and reflects the community's commitment to health, sustainability, and equity.

According to Berkeley's Climate Action Plan, commercial and residential buildings account for 53% of the city's GHG emissions. The first goal of the Plan is for "*new and existing Berkeley buildings [to] achieve zero net energy consumption through increased energy efficiency and a shift to renewable energy sources."* Clean and reduced energy use in buildings is also a key goal of Berkeley's Resilience Strategy.

The State of California, through Title 24, is continually increasing energy efficiency standards for buildings and is now preparing regulations for all new residential construction to be 'zero net energy' by 2020. Berkeley Deep Green Building supports achievement of the state's Title 24 and zero net energy goals.

The usage of natural gas represents 65% of Berkeley buildings' GHG emissions. Incentives to improve energy efficiency and shift from natural gas to electricity make the city's GHG reduction goals more attainable, especially if the proposed Alameda County Community Choice Energy project comes online, offering even cleaner electricity to Berkeley residents.

Technologies exist to support zero net energy in new construction and remodels, but not all building professionals are aware of these opportunities. New electric heat pumps for space and water heating are up to 30-40% [1] more efficient than gas furnaces. New materials for reducing air infiltration and requirements for increased insulation levels reduce the amount of space heating required. These measures, coupled with reduced plug loads, high-efficacy lighting, and solar hot water help to minimize electricity demand. Berkeley Deep Green Building incentivizes all of these, and more.

Program components

The Berkeley Deep Green Building program is offered in two Levels, providing a roadmap to achieve its goals. Initially, the program is envisioned as voluntary, with valuable incentives tied to compliance. Over time, voluntary components will be incorporated into the code, either at the state level or by the City of Berkeley. Since program goals are tied to California's long term energy goals, projects will be eligible for a number of energy efficiency incentives offered by the State as well as for incentives that the City of Berkeley may choose to offer.

Level 1 includes high-impact energy efficiency measures that generally are relatively easy to achieve, and addresses toxicity, responsible sourcing, and water use. Many of these measures dovetail with Title 24 and with state-level efforts to arrive at zero net energy. Incentives to achieve Level 1 standards should be substantial enough to induce most or all projects to comply. Level 2 standards reach further and are tied to additional incentives. In addition, not all components must be adopted to obtain incentives, though more comprehensive adoption will be more highly rewarded.

Each of the components listed below is discussed in more detail in **Appendix A.**

Berkeley Deep Green Building: Level 1

1. Above-code energy efficiency performance standard
2. Prescriptive energy efficiency measures
    a. 100% electric—no gas
    b. 100% high-efficacy lighting
    c. Best-in-class major appliances and equipment
    d. Switched outlets
3. State-defined 'solar ready' plus additional measures, where sufficient solar access exists
4. Cleaner insulation

[1] http://www.climaticva.com/electric-heat-pumps-vs-gas-furnaces/

   a. Insulation free of organohalogen flame retardants
   b. Low global-warming-potential insulation
5. Pre-remodel BESO assessment of home energy efficiency
6. Post-remodel energy, comfort, and air quality monitoring
7. Use of 100% Forest Stewardship Council (FSC)–certified sustainably harvested wood
8. Water conservation measures
   a. 100% extra-low-flow fixtures and appliances
   b. Water-permeable paving
   c. Water-conserving landscape (edible landscaping exempt)
   d. Laundry-to-landscape greywater and greywater-ready tub and shower plumbing

Berkeley Deep Green Building: Level 2

1. Energy efficiency performance standard higher than in Level 1
2. Reduced carbon footprint (embodied energy) of building
   a. Reduced concrete use (for hardscape and other nonstructural applications)
   b. Low-carbon-footprint concrete
   c. Wood in lieu of steel/concrete.
   d. Alternative and creative measures to reduce carbon footprint and to support responsible sourcing in a special, flexible category:
      i. Salvaged siding
      ii. Earth finishes
      iii. Fair trade/sustainably produced/green and fair labor–certified materials
      iv. Other high recycled content, locally sourced/produced and rapidly renewable materials
3. Installed solar photovoltaic (PV) system and/or solar thermal system sufficient to achieve zero net energy for the building, where sufficient solar access exists
4. Reduced toxicity through avoidance of Living Building Challenge Red List chemicals
5. Advanced water conservation measures
   a. Operational tub and shower greywater system
   b. Operational rainwater collection for non-potable domestic use

To learn more about each of the Level 1 and Level 2 measures, refer to **Appendix A**, which is organized in the same manner as the above lists.

Incentives

Over time, some or all of the incentive-based measures in Berkeley Deep Green Building may be incorporated into the building code, while new measures (which become available through industry innovations) can be included in the incentive-based program. For the program to be successful, incentives must be meaningful, motivating and easily understood. Specific incentives will be developed in collaboration with city staff.

Tools and motivators might include assistance with financing (permit fee rebates, low interest loans), relaxation of zoning requirements, bonuses, acceleration of permitting and inspection process, and/or public recognition through competitions, awards and PR events.

In addition, there are a number of local, state and federally sponsored incentives that may apply to projects. These include the following incentives and programs**.**

1. **Property Assessed Clean Energy (PACE)**

   Up to 100% financing of energy efficiency, water efficiency and renewable energy projects with little or no upfront costs, and payment through existing property tax bill. http://energycenter.org/policy/property-assessed-clean-energy-pace

2. **Bay Area Multi-Family Building Enhancements (BAMBE)**

   Cash rebates and free energy consulting for multifamily properties that undertake energy efficiency enhancements. http://bayareamultifamily.org

3. **Property tax exclusion for solar energy systems**

   Customers who install active solar systems such as solar water heaters and solar space heaters will not have their property tax re-assessed. (http://programs.dsireusa.org/system/program/detail/558).http://www.pv-tech.org/news/california_property_tax_exemptions_for_pv_systems_extended_to_2025

4. **Zero net energy pilot program by PG&E**

   Supports research, conducts workshops and outreach activities, and provides design and technical consultations to customers.

5. **Energy efficient mortgages (EEM)**

   The Federal Housing Agency's Energy Efficient Mortgages program helps families save money on their utility bills by enabling them to finance energy efficient improvements with their FHA-insured mortgage. The energy package is the set of improvements that the Borrower chooses to make based on the recommendations and analysis performed by a qualified home energy assessor. (http://portal.hud.gov/hudportal/HUD?src=/program_offices/housing/sfh/eem/energy-r)

6. **PG&E residential energy efficiency rebate program**

a. PG&E offers rebates to eligible residential customers who install energy efficient space conditioning systems and appliances. (http://programs.dsireusa.org/system/program/detail/1428)

b. A similar program is extended to multifamily residential buildings.

7. **PG&E California Advanced Homes (CAHP) incentives**
For builders of new homes, incentives are applicable to homes that display a 15% to 45% improvement over Title 24 2008 codes. Additional incentives are available when onsite solar PV systems are installed or to homes that display more than 40% improvement over Title 24 2013. http://cahp-pge.com/

Education and outreach

Education and outreach are key to the success of the Berkeley Deep Green Building program, ensuring that property owners as well as building, finance and regulatory professionals understand deep green building practices in general and their value to both the environment, and to the bottom line. Outreach is intended to inspire stakeholders to participate in the Berkeley Deep Green Building program, and can appeal to long term financial advantages (lower operating costs and increased desirability/rents/prices for super green and non-toxic buildings), concern for global warming and the welfare of future generations, and civic pride.

Targets for education and outreach will include homeowners, contractors, architects, engineers, landlords, developers, lenders, appraisers, property managers, city planners and staff, building inspectors, press and members of the public.

The education and outreach program might include:

1. Classes covering all measures included in the Berkeley Deep Green Building programs program, organized in collaboration with PG&E, Build It Green, Realtor Associations, the Berkeley Permit Service Center and/or Berkeley's Adult School
2. A citywide design competition for energy efficient building retrofits
    - Winners displayed at Permit Service Center or other locations
    - PR/media attention
    - Awards ceremony or recognition at a City Council meeting
3. Permit Service Center displays and brochures
4. Promotional items such as high-performing Smart Strips, low-flow WaterSense showerheads, etc.

Timeline for review

Energy efficiency measures, renewable energy production technologies and green, certified and non-toxic building materials are evolving rapidly. Berkeley Deep Green Building anticipates periodic review of program components by planning staff and stakeholders, every 2-3 years. Some program components may be incorporated into the building code as mandatory,

while others can be modified, moved to a different Level or updated, and new components can be added. Mandatory periodic review builds in a mechanism for timely adoption of new materials, metrics and methods, as they become available and feasible. State-level changes can be incorporated as well, such as Title 24 updates. Finally, regular review will allow staff to evaluate the success of individual measures and to modify the program as appropriate.

Residential versus commercial

Berkeley Deep Green Building initially focuses on residential projects for several reasons. Commercial buildings are much more varied in their construction and use, requiring a more flexible set of goals. A manufacturing plant requiring 24/7 refrigeration or heat will have very different energy requirements from an office. An initial focus on residential energy efficiency is also consistent with the state's Long Term Energy Efficiency Strategic Plan, which targets zero net energy for all new residential construction by 2020 and for new commercial construction by 2030.

In the residential sector, recent technological changes enable dramatic improvements in energy performance and a shift to all-electric energy. Electric heat pump hot water heaters and new materials for reducing air infiltration have recently become commercially available, and PV prices have dropped significantly in the last 5 years. Commercial projects are addressed to some degree already under other City of Berkeley green building programs. Over time, commercial buildings can and should be incorporated in the program.

New construction and remodeling

Berkeley Deep Green Building components and incentives need to be tailored to new construction and remodels and various building types, i.e. single family, small multifamily and large multifamily. For remodels, thresholds will have to be established to determine when it would be appropriate for Deep Green features to be incorporated. City Staff are in the best position to consider what thresholds are feasible, and dovetail with other phased in requirements.

Berkeley Deep Green Building and other City, Regional and State programs

Berkeley Deep Green Building ties into other ambitious energy efficiency goals. These include:

1. **Building Energy Savings Ordinance (BESO)**

   BESO requires all building owners in Berkeley to complete an energy efficiency audit, helping them save energy and encouraging them to participate in various State-sponsored whole building programs. The assessment is carried out by qualified energy assessors who inform the building owners of incentives and rebates specific to the energy efficiency opportunities of the building.

2. **Title 24**

Title 24 is a stringent, energy efficient, compulsory State building code. It is subject to triennial review and the requirements are revised based on available techniques and technologies. It is anticipated that Berkeley Deep Green Building will use the same metrics as those in force under Title 24, and that measures outlined in the Deep Green program will treat Title 24 as a baseline upon which Berkeley Deep Green Building will improve.

3. **Energy Upgrade California**

   Energy Upgrade California is a state program supported by CPUC, CEC, utility companies, non-profit organizations, small businesses, and various state agencies to help realize California's climate action and energy efficiency goals. It has a partnership with Energy Star to promote the use of energy efficient products and practices.

   This platform also informs home owners of the availability of incentives and rebates. Since it is anticipated that Berkeley Deep Green Building structures would be eligible for a number of incentives and rebates from the state and utility companies, Energy Upgrade California has the potential to encourage home owners to adopt Berkeley Deep Green Building and help realize California's climate action goals.

4. **California Long Term Energy Efficiency Strategic Plan**

   This plan was formulated in 2008 and adopted by CPUC as a single roadmap to achieve maximum energy efficiency in California. The goal of the plan is that all new homes will be zero net energy or zero net energy–ready by 2020. Similarly, Berkeley Deep Green Building encourages all new and existing homes in the City of Berkeley to rapidly become zero net energy.

5. **California Advanced Home Program (CAHP)**

   CAHP is a pay-for-performance whole building approach that aims to improve market demand for energy efficient single family and multi-family homes. It encourages builders of new homes to exceed Title 24 Part 6 by 15 to 45%. (New Residential Zero Net Energy Action Plan – pg. 14).

Appendix A

Level 1 and Level 2 components are explained in more detail below.

Berkeley Deep Green Building: Level 1

1) Above-code energy efficiency (performance component)

Establish robust site energy use intensity (EUI) maximums for various building types for new construction and remodels above a certain threshold size.

Rationale: Studies consistently show that energy efficiency is the most cost effective and generally the most environmentally benign method of reducing GHG emissions. Mainstream technologies available now and common building techniques can easily and significantly reduce building energy usage. In many cases, the upfront costs of improving energy efficiency are recouped with energy cost savings in under 15 years.

A performance target allows for flexibility in reducing energy demand, through a combination of design strategies depending on the specifics of the project. The current average EUI of residential buildings in the Western states is about 40 KBtu/sq. ft. /yr site energy. Analysis performed by Arup and Davis Energy Group on how to achieve State energy use reduction goals shows that close to half of the average energy use can be eliminated through the standard palette of energy efficiency measures:

- Greater insulation.
- Considered placement of windows and addition of thermal mass to optimize passive solar gain and daylighting.
- High efficacy lighting and vacancy controls.
- Reduced plug loads.
- High efficiency appliances and heating equipment.
- Better air sealing.
- Energy efficient windows.

As an example, the current 2030 Challenge target EUIs for residential buildings in western states are 15.4 to 19.1 kBtu/sq. ft. /yr site energy. The 2030 Challenge EUI maximums are set at increasingly lower levels each 5 years with a goal of zero for 2030. The 2030 Challenge allows for the inclusion of onsite generation of energy through solar hot water and PV in meeting the targets. For reference, the Passive House EUI maximum is 38 kBtu/sq. ft. /yr source energy. (This would be about 14.2 kBtu/sq. ft./yr if translated to site energy. In addition, the EUI target does include onsite PV offsets but only after a certain efficiency threshold has been met for the building envelope and solar hot water is included though as it is not related to envelope measures.) Finally, several cities and Architecture 2030, under the umbrella of the Carbon Neutral Cities Alliance, are developing a metric for setting EUI targets that in the future may be appropriate for Berkeley.

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2) Prescriptive energy efficiency measures on top of performance component

a) **All-electric.** Establish program to shift gas end uses in existing buildings to electricity. New buildings to be all electric.
b) **100% high-efficacy lighting.** All lighting, both interior and exterior to be high efficacy, such as fluorescent or LED as per Title 24 2016 definitions.
c) **Best-in-class major appliances/equipment.** All new refrigerators, freezers, stoves, cooktops, dishwashers, washing machines, water heaters, and HVAC appliances must meet one of the following criteria:
    i) Energy Star Most Efficient, OR
    ii) CEE Tier 3, OR
    iii) Enervee 90+ (or whatever benchmark seems most comparable to the two above)
d) **Switched outlets.** At least one outlet in each room will be switched.

Rationale: The prescriptive energy efficiency measures are designed to both shift energy demand from fossil fuels to renewables and to reduce demand that is not easily addressed by the performance standards in component 1.

Shifting homes to all-electric power allows for energy demand to be met with 100% renewables, either onsite or off. In the past, because of line losses and the inefficiency of turning fossil fuel energy into electricity, electricity delivered to the home represented 3 times as much embodied energy as fossil fuel. This is now changing as more and more PV and wind power generation comes online. Both the State's commitment to increasing the Renewable Portfolio Standard, and Berkeley's intention to migrate to cleaner energy sources through the Alameda County Community Choice Energy program are quickly shifting the power sources for electricity to clean renewables.

In addition, recent developments in heating and lighting technologies have dramatically improved the performance of many sources of electrical demand. Heat pumps are more than twice as efficient as the resistance heaters they are replacing. LEDs and fluorescent lights are as much as 10 times more efficient than incandescent and last over 5 times as long. By requiring use of these new technologies, electrical demand can be dramatically reduced.

In addition, tank (heat pump) electric water heaters can be used for energy storage, helping to smooth the energy production/demand ("duck") curve.

Further reductions can be achieved by requiring best-of-class major appliances and switched outlets. Energy Star, administered by DOE, is the main program that evaluates and rates appliance energy efficiency. Appliance efficiency is determined based on specific parameters for each category:

- Television: Power consumption under various modes, display screen size
- Computer monitor: Power consumption under various modes, display screen size
- Clothes washer: Energy efficiency, water efficiency, capacity
- Dishwasher: Energy efficiency, water efficiency, size
- Refrigerator and freezer: Energy efficiency, volume
- Ventilation fans (Range hoods, bathroom and utility room fans): Efficacy, noise
- Ventilation fans (Inline fans): Efficacy

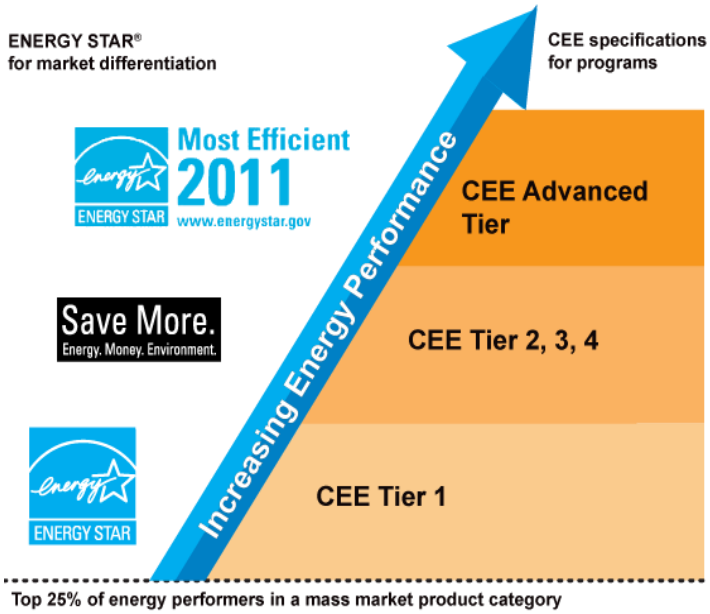
Energy Star Most Efficient is a program that identifies the most efficient Energy Star products in each category.

CEE (Consortium of Energy Efficiency) uses the Energy Star as a benchmark for various tiers:

- CEE Tier 1 is aligned with Energy Star program. Top 25% of models.
- CEE Tier 2, 3 and 4: Tiers above Energy Star minimum to be eligible for incentives. If incentives are offered, this is tied with Save More. Cost effective for customers with incentives.
- CEE Advanced Tier: Stretch targets. Attracts innovations. Top performance. Cost effective in future.

Enervee collects performance data for various appliances, and gives a score from 0 to 100 (the higher the score, the more efficient the product), for each product based on energy efficiency, other product-specific features, and cost. Enervee claims that the data and the scores are updated on a regular basis and presents the most accurate information based on market transformations.

Switched outlets will also enhance energy efficiency by allowing electronic equipment to be easily shut off completely. Many electronic devices draw a small current of electricity all of the time, even when they are not in use. These loads can be significant and while state and federal regulations should be promulgated that eliminate these ghost loads, providing users with a simple switch to turn them off will help in the meantime.



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3) State-defined 'solar ready' plus additional measures, where sufficient solar access exists

Where sufficient solar access exists, provide the necessary components to make building solar ready as per Section 110.10 of the 2013 Building Energy Efficiency Standards (BEES), with the following additions, deletions and exceptions:

Photovoltaic (PV):

a) Main Service panel: if a 200A service, busbar must be 225A minimum with a 200A maximum main breaker; if 100A service, busbar must be 125A minimum with a 100A maximum main breaker. There must be a reserved space in the panel for a double pole circuit breaker located at the opposite (load) end from the input feeder of the busbar.
b) No center-fed main service panels will be used.

c) Inverter location: minimum 3’ wide unobstructed space (from ground to eave above) adjacent to the main service panel; include NEC required working clearance.
d) Module sizing and location: sufficient area for PV modules must be reserved which allows for the anticipated power needs to achieve a zero net energy home, plus the anticipated power needs for Electric Vehicle charging, where parking is provided or required. For a typical zero net energy home there should be space allocated for 10 kW of PV, and if there are additional power needs (such as an electric spa) that power need must also be taken into account. The reserved PV roof area shall be unobstructed and unshaded and facing between 110° to 270° from North: Minimum dimension of the reserved area to be 11’ in the ridge-to-eave dimension, and assuming a power density of 15W/sf; allow for current fire code ridge and side clearances beyond the designated module areas (currently 3’ to ridge and 3’ clear on one side)
e) Clear and unobstructed pathway from the identified inverter location (preferably next to the main service panel) to the identified roof area.
f) OSHA approved fall arrest anchors installed at or near ridges; 5000 lb. capacity each, 8’ maximum on center covering the designated module area.

Solar Thermal:

a) Solar water heater collector location: provide adequate unobstructed and unshaded roof area for an appropriate designated collector square footage on roof(s) facing between 110° (E) to 270° (W). Appropriate designated square footage shall be defined as 0.75 square feet per expected gallon-per-day (gpd) consumption for south facing pitched roofs or 1.5 square foot per expected gpd consumption for flat roofs. Area to be sized such that typical solar collector sizes can fit (no less than 4’x8’ dimensions).
b) Designated location for solar storage tank. Size of storage capacity to be one gallon per gpd of expected daily use (i.e.: A single family home with an expected hot water consumption of 65 gallons per day per household would need a 65 gallon storage capacity). Designated location must be selected to minimize heat losses between hot water heater (within 5 feet of hot water heater or on the roof if ICS or thermosiphon is selected).
c) Minimum (1) 15A 120V receptacle on its own circuit within 5’ of the solar storage tank location for solar water heating pumping and controls.
d) Minimum (1) 50A 240V circuit terminating within 5’ of the water heater location for electric/heat pump water heater.
e) Solar water heater piping: either a chase of a minimum 12” x 12” dimension from within 5’ of the storage tank location to a location even with or within 3’ below the bottom of the designated solar collector location; or a pair of ¾” type M copper pipes plumbed and pressure tested to 100 psi from within 5’ of the storage tank location to a location even with or within 3’ below the bottom of the designated solar collector location.
f) Solar water heating conduit: provide a ½” EMT conduit with pull twine from the solar storage tank location to the roof exit location for solar control wiring. Seal the conduit against weather where it is exposed to the exterior.

g) Solar pool heating: Space must be allowed either on the roof or on the ground for a collector area that is 70% of the anticipated surface area of the pool, facing between 110° (E) to 270° (W). A pathway should be identified for (2) 2" pipes and (1) ½" conduit from the pool equipment area to the bottom of the designated solar collector location, and if feasible the pipe pathway should be sloped such that water could continuously drain back to the pool equipment area.

h) The above provisions are intended to be additive to the solar ready provisions of the existing BEES, except in those cases where they contradict, preclude or replace existing provisions, in which case these provisions supersede.

4) Cleaner Insulation

a) **Insulation free of organohalogen flame retardants.** No insulation used on the project can contain halogenated flame retardants.

b) **Low global-warming-potential insulation.** No insulation can have a lifetime global-warming-potential greater than .05/sq. ft.* R based on chart below developed by Building Green and the Inventory of Carbon & Energy (ICE), Version 2.0, by Prof. Geoff Hammond & Craig Jones

Rationale: Organohalogen flame retardants (sometimes also called halogenated flame retardants, or HFRs) are a class of chemical that is commonly used as flame retardants in polyurethane and polystyrene materials, including insulations. They are also found in some polyisocyanurate insulations. These chemicals have been linked to a host of serious health and developmental problems and also lead to the formation of toxic halogenated dioxins and furans in fires or during thermal processing (Shaw et al, 2010; US EPA 2014; Weber & Kuch, 2003; Ebert & Bahadir, 2003). Many are persistent and bioaccumulative. Building insulation, including disposal at end of useful life, is estimated to be a significant source of these chemicals in the environment (ECHA 2009). 22 chemicals have been banned internationally under the Stockholm Convention on Persistent Organic Pollutants: all are organohalogens, and one is commonly used in polystyrene insulation materials. The American Public Health Association has issued a policy statement calling for reduced use of these flame retardants to protect public health (APHA 2015).

Embodied energy is the measure of the energy that goes into harvest/extraction, manufacture and transport of a product. Reducing and minimizing the embodied energy of materials used in construction, reduces the carbon footprint of the buildings. Reducing the carbon footprint of buildings reduces GHG emissions at the start of a building's life, when they are needed most. Because of the delayed impact of GHGs and the self-reinforcing loops that GHGs trigger, reductions now are more significant than reductions in the future. By limiting the global-warming potential of insulation materials to .05/sq. ft./R, highly insulated buildings will 'pay back' the added carbon footprint of this extra insulation generally in 5 years at most. The only insulations that currently don't meet this standard are extruded polystyrene and closed-cell spray polyurethane.

Because of the chemicals commonly used to expand the foam, extruded polystyrene and closed cell spray polyurethane have an extremely high lifetime global-warming potential. In a 2010 study by Buildinggreen.com ("Avoiding the Global Warming Impact of Insulation," by Alex Wilson,

Environmental Building News, Vol 19.6), the payback from using extruded polystyrene and closed-cell spray polyurethane foam as an additional insulation layer on the outside of a 2 x 6 framed and insulated house was a minimum of 30 years for a house in a very cold climate like Boston. With less than half of the heating and cooling loads of Boston, the payback time in Berkeley for a similar house would be a lot longer.

Another study by Passive House researcher Rolf Jacobson, shows payback periods of 20+ years from using these high global-warming-potential insulations to meet Passive House energy efficiency goals. ("Comparing 8 Cold Climate PH Houses," by Mary James, Home Energy Magazine, Oct. 2014)

Manufacturers are developing safer alternative methods of expanding the foam.

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Lifetime Global Warming Potential of Insulations

Insulation Material	R-value R/inch	Density lb/ft³	Emb. E MJ/kg	Emb. Carbon $kgCO_2/kg$	Emb. Carbon $kgCO_2/ft^2•R$	Blowing Agent (GWP)	Bl. Agent kg/kg foam	Blowing Agent GWP/ bd-ft	Lifetime GWP/ $ft^2•R$
Cellulose (dense-pack)	3.7	3.0	2.1	0.106	0.0033	None	0	N/A	0.0033
Fiberglass batt	3.3	1.0	28	1.44	0.0165	None	0	N/A	0.0165
Rigid mineral wool	4.0	4.0	17	1.2	0.0455	None	0	N/A	0.0455
Polyisocyanurate	6.0	1.5	72	3.0	0.0284	Pentane (GWP=7)	0.05	0.02	0.0317
Spray polyurethane foam (SPF) – closed-cell (HFC-blown)	6.0	2.0	72	3.0	0.0379	HFC-245fa (GWP=1,030)	0.11	8.68	1.48
SPF – closed-cell (water-blown)	5.0	2.0	72	3.0	0.0455	Water (CO_2) (GWP=1)	0	0	0.0455
SPF – open-cell (water-blown)	3.7	0.5	72	3.0	0.0154	Water (CO_2) (GWP=1)	0	0	0.0154
Expanded polystyrene (EPS)	3.9	1.0	89	2.5	0.0307	Pentane (GWP=7)	0.06	0.02	0.036
Extruded polystyrene (XPS)	5.0	2.0	89	2.5	0.0379	HFC-134a[1] (GWP=1,430)	0.08	8.67	1.77

1. XPS manufacturers have not divulged their post-HCFC blowing agent, and MSDS data have not been updated. The blowing agent is assumed here to be HFC-134a.

http://www.greenbuildingadvisor.com/blogs/dept/energy-solutions/avoiding-global-warming-impact-insulation

5) Pre-remodel BESO assessment of home energy efficiency.

Submit paperwork from BESO assessment with permit application for remodel.

Rationale: BESO requires building owners to complete an energy performance assessment and publicly report the building performance information via an electronic reporting interface controlled by the Director of Planning and Community Development or their designee. Energy assessment is carried out by registered energy assessors who provides recommendations to improve the energy performance of the building. For BESO energy assessment one of the following is required:

a) Home Energy Score: Home Energy Score is developed by LBNL and rates homes on a scale of 1 to 10, 10 indicating excellent energy performance. Home energy Score includes the score, energy use breakdown, data collected and recommendations to improve energy performance.

b) Energy Upgrade California (EUC) Advanced Assessment: Home Upgrade has a network of qualified energy assessors in the bay Area who can assess homes and identify opportunities for energy performance improvement.

c) High Performance: If a qualified energy upgrade has been completed or if the building is already very energy efficient, the owner can submit evidence of these upgrades or this efficiency in lieu of the BESO audit.

The BESO assessment informs owners on the building's energy performance and provides a roadmap for improvement. Assessments are carried out by registered assessors using advanced diagnostic tools. While encouraging them, the system makes it voluntary to incorporate performance improvement measures. Reducing one's carbon footprint, improving comfort in the house and saving on energy bills are all incentives for building owners to carry out recommended changes. Improved marketability of energy efficient residences is a further incentive to owners to implement recommended energy conserving measures.

6) Post remodel energy, comfort, and air quality monitoring (operational rating)

a) For a period of one year following completion of construction, monitoring will be carried out for the following parameters: hot water use, appliance loads, space heating loads, interior temperature, relative humidity and CO2 levels. Consider requiring entry of projects as case studies into the NZEC-NESEA inventory, for which all case studies are QA'd by NREL before publishing.

b) Project must document energy use meets target expectations to be eligible for incentives from the City.

c) Monitoring data will be included in a public database (that protects privacy) and compared to pre-construction projected energy use in bi-annual reports. Reporting could potentially be less frequent if incorporated into NZEC-NESEA inventory.

Rationale: The intention of Berkeley Deep Green Building is to radically improve the comfort, performance and indoor air quality of buildings throughout the City of Berkeley. However, without a means to track these improvements, it may not achieve the outcomes required to reduce our global carbon emissions. Therefore, the program includes a mandatory monitoring for all participants. A list of devices for tracking both energy performance and indoor air quality are included below.

Bi-annual reports examining the data will help to direct future improvements to Berkeley Deep Green Building.

Energy Use Monitoring Systems:				
Name	Website	Cost	#circuits	Cost/circuit
eGauge EG3010 (Residential)	http://www.egauge.net/	$544	12	$45.33

eGauge EG300 (commercial)	http://www.egauge.net/	$494.00	12	$41.17
SiteSage	http://powerhousedynamics.com/	tbc	44	
PowerSave Envi	http://www.currentcost.net/	$129	10	$12.90
Lgate	http://locusenergy.com/	tbc	2	
EnergyCloud	http://bluelineinnovations.com/	$89	1	$89.00
TED 5000	http://www.theenergydetective.com/	$199.00	1	$199.00
TED Pro Home	http://www.theenergydetective.com/	$300.00	32	$9.38
Wattvision	http://www.wattvision.com/	$99.00	1	$99.00
(Highlighted cells are the ones that look most viable and informative for tracking home energy use)				
IAQ Monitoring Systems:				
Foobot	http://foobot.io/	$199.00		
Elgato Eve Room	https://www.elgato.com/en/eve/eve-room	$75.00		
Netatmo Home Weather Station	https://www.netatmo.com/	$148.00		
			updated:	3/2/2016

http://www.homepower.com/articles/home-efficiency/electricity/tracking-your-energy-use

7. FSC-certified wood

FSC-certified wood and wood products are to be used when available.

Rationale: FSC is an independent member-led group that advocates use of wood sourced from sustainably managed forests (see us.fsc.org/en-us). FSC-certified wood aligns with the Berkeley Deep Green Building requirement for sustainably sourced materials and offers the following benefits:

- FSC standards for forest management discourages harvesting wood from old-growth forests, thus preventing loss of natural forest cover.
- The standards extend to protection of water bodies and prevention of use of hazardous chemicals, such as Atrazine, that are otherwise allowed in the US.
- FSC requires forest managers on both private and public lands to involve the local community and protect indigenous people. It requires the local community to be part of the decision-making on impacts of operations and certification.

- FSC audit reports on public and private lands are available to the public.

FSC wood and wood and cabinetry and windows made with FSC wood are available from many local sources. A list of these sources, updated annually, is available from the Ecology Center on San Pablo Ave.

Note: the SFI certification is not a comparable alternative and cannot be used as a substitute certification program.

8. Water Conservation

All new plumbing fixtures to be 100% extra-low flow fixtures and appliances.

Fixture	Flow rate mandated by California Energy Commission (gpm)	Maximum flow rate recommended by Berkeley Deep Green Building (gpm)
Faucet	1.2	.5
Shower	-	1.25
Kitchen Faucet	1.8 that can be increased to 2.2	1.8 (for functional reasons such as pot filling)
Toilets	1.28	1

Permeable paving. Maximize permeable paving. Paving materials such as gravel, pervious concrete or asphalt, spaced paving blocks, loose materials, or tire spurs allow storm water to percolate and infiltrate into the ground, allowing for groundwater recharge and reduction in runoff and flooding. When choosing a permeable paver, consider Americans with Disabilities Act (ADA) access requirements and the anticipated vehicular load in hardscape areas. Areas with very high traffic or very heavy anticipated loads may not be suitable for pervious paving strategies. Examples of permeable paving are: Pervious concrete or asphalt, an open-grid pavement system with at least 50% permeability, permeable materials, such as gravel, decomposed granite, or sand.

Water conserving landscape. Post construction landscape design shall be designed to achieve the following:

1. Areas disrupted during construction are restored to be consistent with native vegetation species and patterns.

2. Limit Turf areas to 10 percent of the total landscaped area.

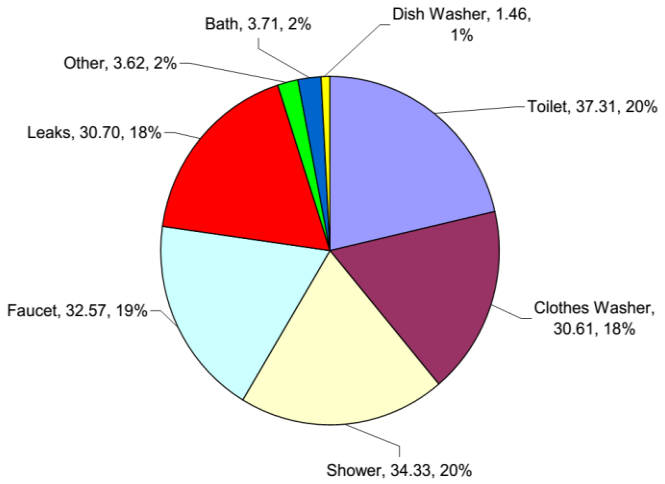
3. Utilize at least 75 percent native California or drought tolerant plant and tree species appropriate for the climate zone region. Areas devoted to edible landscape exempt because of importance of localizing food supply.

4. Plants to be hydrozoned by water needs.

Laundry-to-landscape greywater and greywater-ready tub and shower plumbing. Install laundry to landscape greywater system. New showers and tubs to be plumbed to be greywater ready: i.e. greywater piping kept separate from black water piping in such a fashion as to provide easy access for diversion into a greywater system at a future date.

Rationale: It is estimated that the average resident in Northern California uses 171 gallons per day for indoor use and 125 gallons per day for outdoor use. It is also estimated that residents of the Bay Area use less than 171 gallons of water for indoor use (California Single Family Water Use Efficiency Study, 2011).

The following chart presents a perspective on the average residential water use in California.



A state of emergency was declared in California in 2014 due to drought conditions. Record low precipitation in 2014 affected drinking water reserves in the state. Precipitation in subsequent years has not been enough to bring California out of the drought situation. This emergency prompted the State to take corrective actions and make the water efficiency standards in buildings and in agricultural practices more stringent. It is imperative that all new and existing buildings honor this commitment by the State. The water efficiency goals of the Berkeley Deep Green Building program will be in line with the State's commitment and requirements.

Water-permeable paving allows infiltration of rainwater into the ground and helps recharge ground water. It prevents excess storm water runoff that overloads the capacity of our wastewater treatment plants (where there are combined sewer and stormwater systems). Additionally it filters pollutants from runoff thus improving the quality of storm water runoff and preserves ground water quality.

Limiting turf area conserves water as turf has high irrigation needs. Native turf varieties are recommended instead because of their lower irrigation needs. Limiting turf area will allow the owner to explore alternate irrigation options such as drip irrigation which work well with other landscaping species

More efficient irrigation can be achieved by clumping species with similar irrigation needs together in the landscape.

Re-use of greywater for landscape irrigation has been estimated to offset from 16 to 40% of municipal potable water use.

Laundry-to-landscape greywater systems are easy to install, economical, and do not require a permit so long as explicit guidelines are followed.

Tub/shower greywater can readily be diverted for re-use in the landscape so long as the drainage piping is accessible and there is adequate space in the piping to install a backwater valve and diverter valve. If not anticipated with the installation of "greywater ready plumbing", it can become cost prohibitive in the future to attempt to capture that greywater for re-use. Where a new tub/shower is situated on a slab, the drain piping can be routed to an area (even outside the building footprint) where access can be provided before it joins black water drain piping. Similarly, upstairs tub/showers can have drainage piping extend into lower walls or the crawlspace to provide that access, before combining with black water piping.

Ideally, landscaping would be designed to optimize greywater re-use from various sources in the home using the least expensive types of greywater irrigation systems.

References:

Stormwater fact sheet.pdf by Bay Area Stormwater Management Agencies Association

California Code of Regulations Title 23, Division 2, Chapter 2.7. Model Water Efficient Landscape Ordinance. (https://govt.westlaw.com/calregs/Document/I8403E54417874B8B94843C8A8341823B?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=(sc.Default)&bhcp=1)

DWR offers rebates to replace turf with other native species. (http://www.saveourwaterrebates.com/turf-replacement-rebates.html)

Berkeley Deep Green Building: Level 2

1. Higher above code energy efficiency (performance component)

Establish even lower energy use intensity maximums than tier 1
for both new construction and remodels above a certain threshold in size. See item 1. above for rationale.

2. Reduced embodied energy (prescriptive measures)

a. **Reduce concrete use (reduce concrete use for hardscape and other nonstructural applications).** Consider prohibition on use of materials high in

embodied energy such as new concrete and kiln-fired brick, pavers, etc., for non-structural purposes.

b. **Low embodied-energy concrete.** Specify concrete with global-warming potential 30% or more below standard mixes as established by the NRMCA.

"Supply concrete mixtures such that the total Global Warming Potential (GWP) of all concrete on the project is 30% or more below the GWP of a reference building using Benchmark mixes as established by NRMCA and available for download at www.nrmca.org. Submit a summary report of all concrete mixtures, their quantities and their GWP to demonstrate that the total GWP of the building is 30% or more below the GWP of the reference building. Contractor may use the Athena Impact Estimator for Buildings software available at www.athenasmi.org or other similar software with the capability of calculating GWP of different mix designs."

c. **Wood in lieu of steel/concrete:** Where it is possible to substitute, wood (including cross-laminated timber and other engineered wood products) will be used in lieu of concrete and steel structural systems.

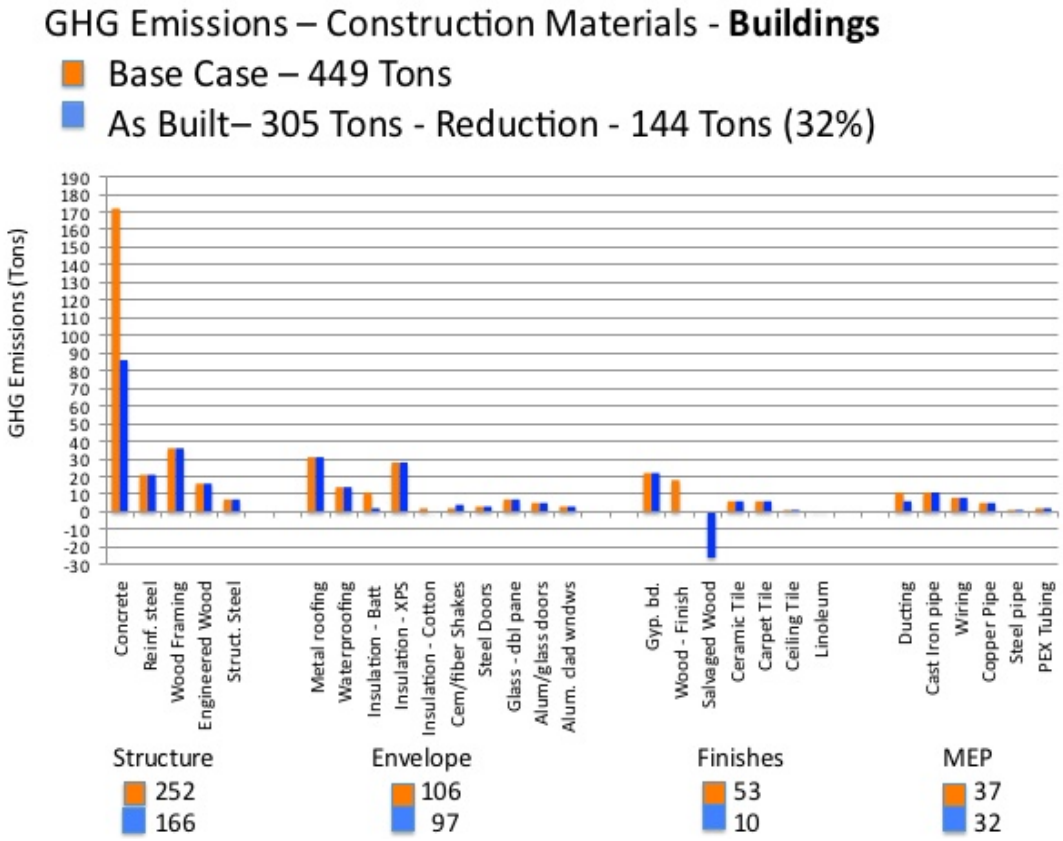
d. **Petition for consideration of alternative measures for reducing embodied energy. For example, salvaged siding, earth finishes, high recycled content, locally sourced, rapidly renewable materials, and remodeling rather than constructing new.**

Rationale: As operational energy goes down, the significance of energy embodied in materials increases. Currently over a buildings whole life, embodied energy accounts for roughly 20% of a building's total GHG footprint. However, in the first 20 years of a building's life, this can be 50% or more. In addition, as we approach zero net operating energy, these numbers increase, eventually reaching 100%.

Low-carbon materials provide net GHG emissions reductions now, when GHG emissions reductions are most effective and are needed most because of the delayed impact of GHGs and the self-reinforcing loops that GHGs trigger.

Low-carbon construction can reduce the embodied energy of a typical building by 30 to 50%, with 20% achieved through simple substitutions.

Rapidly renewable plant materials, wood, earth and stone are the primary low-carbon construction materials. Use of rapidly renewable plants and wood products actually sequesters atmospheric carbon and could be assembled to create a carbon negative house. Metal and plastics in general have a very high carbon footprint and should be avoided where possible. Concrete, while lower in embodied energy per pound, is used in such great quantities that its global warming impact tends to dwarf that of other materials used in construction. A detailed analysis of the embodied energy of a building recently designed by Siegel and Strain Architects shows the relative significance of various components:



Berkeley Deep Green Building focuses on reducing concrete in nonstructural uses because there are many good low-carbon alternatives. It encourages use of wood instead of concrete and steel structurally because structural systems contribute most to a building's overall embodied energy. Where concrete is essential structurally, many methods exist to reduce the embodied energy of concrete significantly without compromising its performance.

Finally, where wood is use mainly for the structure, advanced framing techniques can be employed that can reduce the amount of lumber used by up to 25%. Advanced framing components include:

- Framing walls with studs at 24" on center.
- Designing windows and doors on the plywood/sheetrock module
- Single top plates instead of double top plates
- Single stud at window
- No headers over doors and windows in nonbearing walls
- No cripple under windows
- Hang window and door headers instead of using Jack studs
- Use only 2 studs for corners

Additional information about this construction technique is available in **Efficient Wood Use in Residential Construction: A Practical Guide to Saving Wood, Money, and Forests** by Ann Edminster and Sami Yassa, 1998. Natural Resources Defense Council

References:

"Greenhouse Gases and Home Building: Manufacturing, Transportation, and Installation of Building Materials," by Warren Carnow, National Home Builders Association, September 2008 http://www.nahb.org/en/research/housing-economics/special-studies/archives/greenhouse-gasses-and-home-building-2008.aspx

Lessons Learned from Recent LCA Studies, SEAOC 2013 Convention Proceedings, by Frances Yang

SEAOC LCA Study: Comparing Environmental Impacts of Structural Systems, SEAOC 2013 Convention Proceedings, by Anthony Court, Lisa Podesto, Patti Harburg-Petrich

http://www.usda.gov/wps/portal/usda/usdamediafb?contentid=2011/09/0426.xml&printable=true&contentidonly=true

Science Supporting the Economic and Environmental Benefits of Using Wood and Wood Products in Green Building Construction, y Michael Ritter, Kenneth Skog, and Richard Bergman, USDA, Forest Products Laboratory, GTR FPL-GTR-206, page 4 http://www.fpl.fs.fed.us/documnts/fplgtr/fpl_gtr206.pdf

http://www.woodworks.org/why-wood/

http://www.rethinkwood.com/

"Clock is Ticking," by Larry Strain, greensourcemag.com, May/June 2011, http://www.siegelstrain.com/site/pdf/201105_ClockisTicking-LStrain.pdf

http://archpaper.com/2016/04/time-to-experiment-anew-david-benjamin-on-embodied-energy-and-design/#gallery-0-slide-0

http://apps1.eere.energy.gov/buildings/publications/pdfs/building_america/26449.pdf

http://www.apawood.org/data/sharedfiles/documents/m400.pdf

http://www.usahers.com/pdffiles/VEFraming1-17-01.pdf

3. Solar photovoltaic (PV) system and/or a solar thermal system sufficient to achieve zero net energy for the building, where sufficient solar access exists

Where sufficient solar access exists, install a solar PV and/or solar thermal system, sized as required to achieve zero net energy for the building, including excess inverter capacity for expansion.

Photovoltaics: The PV system shall be sized to offset 100% of on-site electrical loads, and in addition shall include either 1) inverter capacity for the PV modules needed to supply power for at least 2 EVs which travel 30 miles per day round trip, or 2) adequate space and breaker capacity at the main service panel to add this inverter capacity later. If the system uses micro inverters then no added inverter capacity is required. Prioritize usage of roof areas which have a 90% or

greater annual solar access; if those areas prove insufficient, utilize areas with not less than a 70% solar access. System sizing should be done using one of the nationally accepted solar calculator tools, such as PVWatts, PVSyst, Helioscope, and SAM.

Solar thermal: A solar thermal system will typically offset between 50% and 70% of a residence's annual hot water loads. If the building design indicates a need for solar thermal to achieve zero net energy, then the system must be installed in a way that achieves a minimum 50% solar fraction. Any SRCC OG300 certified system may be used; however, if the system involves hot water storage on the roof then the roof structural design must be proven adequate to carry the additional load. If there is going to be a swimming pool on the property there should also be an adequately sized unglazed or glazed solar pool heating system.

4. Reduced toxicity through avoidance of Living Building Challenge Red List chemicals

Projects cannot use products that contain chemicals on the Living Building Challenge Red list. These chemicals are:

- Alkylphenols
- Asbestos
- Bisphenol A (BPA)
- Cadmium
- Chlorinated Polyethylene and Chlorosulfonated Polyethlene
- Chlorobenzenes
- Chlorofluorocarbons (CFCs)
- Chloroprene (Neoprene)
- Chromium VI
- Formaldehyde (added)
- Halogenated Flame Retardants (HFRs)
- Hydrochlorofluorocarbons (HCFCs)
- Lead (added)
- Mercury
- Polychlorinated Biphynels (BCPs)
- Perfluorinated Compounds (PFCs)
- Phthalates
- Polyvinyl Chloride (PVC)
- Polyvinylidene Chloride (PVDC)
- Short Chain Chlorinated Paraffins
- Wood treatments containing Creosote, Arsenic or Pentachlorophenol
- Volatile Organic Compounds (VOCs) in wet-applied products (above specified amounts)

The International Living Future Institute, which manages the Living Building Challenge, grants temporary exceptions for many Red List Chemicals owing to current limitations in the materials economy. These same exceptions, as outlined in the Living Building Challenge 3.0 Materials Petal Handbook, shall apply in Berkeley Deep Green Building. However, no exceptions shall be made

for halogenated flame retardants (HFRs) in insulation given the availability of alternative materials that do not contain HFRs.

Rationale: The International Living Future Institute has assembled a list of chemicals it identifies as the "worst in class" materials, chemicals, and elements known to pose serious risks to human health and the greater ecosystem." Ultimately, they should be phased out of production because of toxicity concerns. A growing body of research is demonstrating the role of chemical pollutants in the development of a broad array of childhood and adult diseases (e.g. neurodevelopmental disabilities, asthma, allergies, psychiatric disorders, immune deficiencies, birth defects, cancers, diabetes, endometriosis, infertility, and Parkinson's disease). The time of greatest vulnerability is during pregnancy, when minute exposures to the fetus during critical developmental windows can set a child up for a lifetime of chronic illness.

Unfortunately, there is very little federal regulation to ensure the safety of the >85,000 synthetic molecules developed since WWII. When Toxics Substances Control Act (TSCA) was passed in 1976, 62,000 chemicals were simply grandfathered in as being permissible to use in commercial products. Of the 20,000 plus new chemicals developed since then, health data has been generated on only 15% of them. Since the passage of TSCA, the EPA has outlawed only 5 chemicals under this law.

Building consumes 40% of raw materials globally (3 billion tons annually) and therefore contributes substantially to the extraction, manufacture and use of materials in our environment. Avoidance of building products containing ILFI Red List Chemicals helps to create safe environments in our homes and redirects manufacturing to a more sustainable future.

References:

www.greensciencepolicyinstitute.org

www.braindrain.dk

http://jama.jamanetwork.com/article.aspx?articleid=185391

http://www.healthandenvironment.org/about/consensus

http://arjournals.annualreviews.org/e...

https://www.youtube.com/watch?v=E6KoMAbz1Bw Little Things Matter by Bruce Lanphear, MD, Prof at Simon Fraser University, Published on Nov 11, 2014

5. Advanced Water Conservation Measures

a. **Operational tub and shower greywater system**. Direct all shower/tub water to permitted outdoor greywater system.

b. **Operational rainwater collection for non-potable domestic use.** A minimum 1000 gallon rainwater system to be installed for use for toilets and/or laundry.

Rationale:
California enacted the Rainwater Recapture act in 2012 which allows residents to capture and use rainwater collected onsite. There are many benefits to capturing and reusing rainwater onsite:

- Rainwater use offsets the demand on the potable water supply which is under a great strain because of the State's drought conditions.
- While the individual capacities of rainwater barrels or cisterns are inadequate for agricultural or industrial purposes, they are adequate for residential non-potable applications. If every home in the City of Berkeley collected and used rainwater, at the minimum for outdoor irrigation, the water saved in the reservoirs could be diverted to other applications that do not offer much flexibility, such as agricultural and industrial applications. Consequently this relieves the demand on the potable water supply.
- Rainwater is a free and clean source for irrigation. It is low in sodium and chloramine and is fluoride free.
- Additionally, basic filtration and treatment makes rainwater fit for other uses such as toilet flushing and cleaning laundry (subject to permitting requirements).
- Capturing rainwater reduces the speed of flow in storm water systems and into the Bay. This helps in preventing changes in the local ecosystem.

Greywater is lightly used water from tubs, showers, sinks and clothes washers: so long as care is taken in the choice of cleaning products it can be effectively re-used for outdoor irrigation. Using municipal water twice lowers the embodied energy/carbon footprint per use, reducing the chemicals and costs involved in treating water initially to potable standards and later in treating it before release back into the environment.

Fortunately there are many systems available ranging in price and suitability for different types of landscapes. The simplest and least expensive sends the greywater directly to the garden as it is produced, via gravity or using the pump already in the washing machine. Mulch basins in the landscape allow the greywater to infiltrate into the soil, and are best suited for irrigating larger trees, shrubs, vines, perennials.

More expensive systems utilize tanks, pumps, filtration and sophisticated controls in order to distribute the greywater in regulated amounts through special drip tubing. Some require that the homeowner clean the filters, others provide automatic back flushing of filters using potable water (with cross connection protection) or air.

There are even specialized greywater systems that can be installed under turf. Other whole house systems gather the greywater, treat it onsite to the NSF 350 standard so that it is no longer technically greywater, and utilize it for toilet flushing.

It is wise to anticipate the desired type of system (and budget) and design/plumb accordingly—some systems require space for necessary equipment to be installed, either indoors or out, and require that all greywater piping lead to one location.

Even if there is no plan to implement a system, installing plumbing to be 'greywater ready' is a courtesy to all future owners of the property when greywater re-use may be mandatory.

Currently all systems require a permit except the laundry-to-landscape system, which must abide by code-specified guidelines to be exempt.

References:

The Water Wise Home, by Laura Allen, Storey Press, 2015

Stormwater fact sheet.pdf by Bay Area Stormwater Management Agencies Association

http://www.ci.berkeley.ca.us/Planning_and_Development/Energy_and_Sustainable_Development/Rainwater_Harvesting.aspx

Ideas from community input session 06.14.2016

Level 1

1. Bike parking to be included in both new and existing homes
2. Clause to be added on EUI with respect to number of bedrooms.
3. Carbon sequestration (need more inputs on how this can be achieved without cluttering the program). One is encourage residents to separate recyclables, composting and landfill trash, similar to what is done in San Francisco. (http://sfenvironment.org/zero-waste/recycling-and-composting/residential-recycling-and-composting) However, not sure if this accounts to carbon sequestration.
4. Secondly under carbon sequestration, we could add construction waste recovery and recycling, which requires collecting construction waste and sending all recyclable waste to authorized recyclers and / or send reusable materials to other construction sites. This is to minimize waste going to landfills. This is similar to the measures in LEED.

Level 2

1. Incorporate EV charging points in all multifamily homes and newly constructed single family homes
2. Reduce number of parking spaces in homes within 0.25 miles of public transit.

Councilmember Ben Bartlett
City of Berkeley, District 3

CONSENT CALENDAR
June 13, 2017

To: Honorable Mayor and Members of the City Council

From: Councilmembers Ben Bartlett, Kate Harrison, Sophie Hahn, Susan Wengraf

Subject: Referral to the Energy Commission and the City Manager: Electric Vehicle Charging Ordinance

RECOMMENDATION

Refer to the Energy Commission and the City Manager to develop an Electric Vehicle (EV) Charging Ordinance for the City of Berkeley.

The Ordinance shall consider the following requirements for installation of electric vehicle charging infrastructure in all new buildings or buildings undergoing major alterations:

1) Electrical capacity is sized to simultaneously charge vehicles in 20% of parking spaces. At this electrical capacity, load management systems can readily be installed later as needed to enable cost-effective electrical vehicle charging to 100% of parking spaces.

2) 10% of parking spaces have full circuits (breakers, conduit, wiring, etc) enabling simple installation and activation of standard Level 2 chargers.

3) 10% of parking spaces have conduit installed from the electrical panel(s) to each parking space enabling either Level 2 chargers or the option to upgrade selected circuits to higher amperages.

4) 80% of parking spaces are “electrical vehicle capable” with project plans indicating the path of future wiring to each parking space and conduit is installed at critical points such as trenches, concrete wall penetrations, etc.

5) Allow the option of installing fast chargers to meet the EV-Ready requirements.[1]

[1] San Francisco officials estimate that installing such infrastructure during construction is expected to save developers and the city 75% of the cost to retrofit buildings and parking spaces to meet future electrical vehicle charging needs.

6) 10% of new parking spaces have Level 2 electrical chargers installed.

BACKGROUND
As adoption of electric vehicles grows in the region and statewide, there is a greater demand for residential, workplace, and commercial electric vehicle charging stations.

An abundance of publicly accessible electrical vehicle charging infrastructure is critical to reassuring consumers who purchase, clean, low carbon electric vehicles that they can reach desired destinations by recharging their car batteries along the way. Access to ample electrical vehicle charging for those living in apartment and condo buildings is also essential.

Charging infrastructure not only needs to be installed for existing electric vehicles, but also to accommodate up to 1 million zero-emission vehicles by 2020 and 1.5 million zero-emission vehicles on California roadways by 2025 per Governor Brown's Executive Order.[2]

California's Green Building Standards Code was the first state-adopted green building code in the nation. It includes mandatory and voluntary measures to ensure residential and commercial new construction projects are ready for electric vehicle infrastructure.

Local jurisdictions have authority to adopt more stringent electric vehicle readiness standards beyond the mandatory requirements. Many other Cities in the region, including San Francisco, Fremont, Palo Alto, and Oakland, have already done so. Berkeley is lagging behind.

Berkeley must establish additional policies to support electric vehicle charging infrastructure. Transitioning to renewable energy will benefit the health, welfare, and resiliency of Berkeley and its residents. It will make Berkeley less vulnerable to climate change, heat events, rising sea levels, and the associated health and infrastructure impacts.

FINANCIAL IMPLICATIONS
Staff time.

ENVIRONMENTAL SUSTAINABILITY
This item will result in positive effects on the environment.

CONTACT PERSON
Councilmember Ben Bartlett, 510-981-7130

[2] Governor Brown's Zero-Emission Vehicle Executive Order, March 23 2012. https://www.gov.ca.gov/news.php?id=17463