

# Green Building Code

## DESCRIPTION

A green building code would directly modify the City's building codes to introduce greater emphasis on sustainability, energy reduction, and climate change goals within all relevant sections of the codes, to capture potential savings and improvement in all aspects of a building's design, construction and operations. Since all new construction and major renovations would be required to meet the code requirements, this would force a wholesale shift towards green building for all construction in the City.

## POLICY OBJECTIVE

The objective of a Green Building Code is to introduce a wholesale redefinition of applicable building codes to require all new construction and major renovations to meet green building requirements, including specific requirements for all aspects of a building's design that could affect energy performance.

SUMMARY RATINGS (★★★★★ = best/most feasible)			
ENERGY EFFICIENCY POTENTIAL	★★★★★	COST EFFECTIVENESS	★★★
ECONOMIC BENEFIT	★★★★★	ADMINISTRATIVE FEASIBILITY	★★★
COST OF IMPLEMENTATION	★★★		

## ENERGY EFFICIENCY POTENTIAL

★★★★★

*Long-term energy savings potential is high on a project scale. The overall impact on energy efficiency within the City is dependent on the specific mandatory requirements of the policy.*

- **Energy savings potential:** Energy savings potential is tied to the specific requirements of the green building code. No specific energy improvements are mandated by compliance with ASHRAE Standard 189.1, however energy modeling has indicated compliant buildings are likely to be between 10% and 40% (with an average of 25%) more efficient than ASHRAE Standard 90.1-2004 buildings. Through a green building code, specific energy reduction targets could be provided to comply with Architecture 2030 goals, provided that the technical requirements of meeting such standards are economically feasible for developers in the City. This could either be done by mandating a performance based route for energy compliance or through the provision of mandatory standards which would be expected to achieve energy performance targets in line with Architecture 2030. Where green building codes include provisions for energy codes or energy use reduction the same standards may be applied to both the green building and energy codes, thus yielding equivalent energy savings potential performance.
- **Cumulative Energy Savings:** This policy would generate energy savings of between 1,600,000 and 1,900,000 MWhr through 2030, assuming a 20% improvement in energy efficiency for 70% of new development within the City (assuming 30% of new development in single family residences which may be exempt from the code).
- **Applicability to 2030 Challenge targets:** To meet the 2030 Challenge Goals, a green building code would have to include specific energy requirements and set a timetable to achieve specific energy reduction targets in line with the 2030 Challenge.

## ECONOMIC IMPACTS

★★★★★

*Excellent potential for job creation as all new construction projects would fall under the requirements of the code, forcing a wholesale shift towards green building in the City.*

- **Job creation potential:** A mandatory green building code would drive a wholesale move towards green construction practices in the City. As such, it is likely that new jobs would be created in all aspects of green building design and construction. This is corroborated by officials at the California Energy Commission and California Building Standards committee, who expect that in locations where compliance with the California Green Building Code is mandatory, jobs will be created in all areas of green building design. Officials from the ASHRAE Standard 189.1 Project Committee believe that implementation of Standard 189.1 will have a similar effect although they also noted that the extent to which new jobs will be created is largely dependent on the green building requirements in the City, and the current supply of qualified green building professionals and trade workers in the City.
- **Policy enforcement:** Where existing green building policies already exist, officials have noted that policy enforcement is crucial to a policy's real world success. Despite this, enforcement is an area often overlooked or poorly

administered. Strong policy enforcement in Seattle could lead to the creation of numerous jobs through the creation of a green building inspection and enforcement industry within the City.

- **Overly stringent policy could negatively impact real estate market:** Increased costs to developer would either get passed on to consumers or eat into profit margins, either of which could adversely impact the real estate market.

## **COST OF POLICY IMPLEMENTATION**

★★★

*Costs to the City in implementing an existing 3<sup>rd</sup> party green building code, such as ASHRAE Standard 189.1 would be dependent on the number of amendments which must be made to existing standards.*

- **Cost to the City:** Implementation costs to the City are largely dependent on the changes which would have to be made to the existing building codes, or to the 3<sup>rd</sup> party green building standards such as ASHRAE Standard 189.1. As Seattle already has a comprehensive set of building standards which include green policies, implementing a 3<sup>rd</sup> party code would require a review to ensure the two codes are in alignment. Initial analysis performed by the Seattle City officials suggests that this would be a significant undertaking. As neither the California Green Building Code nor ASHRAE Standard 189.1 has been implemented in any local jurisdiction, costs of policy adaptation are difficult to predict. Anecdotal evidence however suggests that whilst some aspects of policy administration and enforcement could be integrated into the existing building inspection department infrastructure, additional staff training would need to take place to ensure officials fully understand the code requirements. Additional staff may also be required in order to meet the increased administration and implementation workload, particularly in the period immediately prior to and following the code's implementation. Whilst implementation costs are likely to be high, once introduced, ongoing policy development costs to the City are likely to be manageable as updates would be conducted in line with the City's existing cyclic code review process.
- **Cost to the developer:** Green building code compliance is likely to result in cost increases for the developer in order to make buildings compliant with the more stringent requirements of the code. The magnitude of the cost is dependent on the specific requirements of the code. Compliance with the California Green Building Code is expected to increase construction costs by between 2 and 3% (equivalent to achieving LEED<sup>®</sup> Silver certification). The SSIM building energy model estimated the cost of achieving a 20% energy efficiency improvement at 2.1% of project cost.

## **COST EFFECTIVENESS**

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*The cost-benefit analysis indicates that the program would be effective for the City, though developers will experience some financial burden in complying with the standard at initiation.*

- **Direct City Benefit Cost ~9:** \$9.00 of energy savings per \$1.00 of program costs to the City. This ratio is quite high due to the comparatively low cost to the City of administration and policy development compared high energy savings over time.
- **Net Benefit Cost ~0.2:** \$0.20 of monetized energy savings and financial benefit to developer for every \$1.00 of costs to the City and developer. This ratio is low due to the large financial investment required on the part of developers to comply with the standard (the cost of code compliance will likely decrease with time and developer experience), with little corresponding financial benefit to the developer in terms of additional rents or offset costs.
- **Cost per MWhr saved low:** ~\$5.10 per MWh saved.

## **ADMINISTRATIVE FEASIBILITY**

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*Using an externally developed green building code, such as ASHRAE Standard 189.1 would ease the administrative burden on the City.*

- **Review of existing building standards must be undertaken:** In implementing a 3<sup>rd</sup> party standard, such as ASHRAE Standard 189.1 a comprehensive review of the compatibility of existing building standards with the 3<sup>rd</sup> party code must be undertaken. Officials involved in the development of the California Green Building Code reported that, had Standard 189.1 been available at the time of the code's writing, the standard would have been referenced throughout in order to reduce the confusion which may arise from the existence of multiple green building codes. This is expected to be the case with future developments of the code. However it should be recognized that ASHRAE Standard 189.1 is still in development and its date for final publication is currently unknown.
- **Washington State building standards may conflict with green building code requirements:** which may limit the scope of a proposed green building standard, particularly in the residential sector where approval would be required at State level for any changes to residential code requirements. The administrative burden on the City would be significantly eased were the State to adopt a green building standard within its codes.

## **STAKEHOLDER IMPACT**

- **Project costs would increase in order to achieve compliance with code standards:** If the cost of compliance is prohibitively high, the developer community would be adversely impacted.
- **Opposition may be felt regarding the implementation of specific standards within the code:** Some elements of

the building industry in the City, such as the smaller developers and multi family residential developers who may feel burdened with the additional costs incurred through complying with a green building code. Officials at the California Building Standards Commission also highlighted the need to be prepared for opposition to certain policies, particularly those relating to land use which the developer community felt were neither nor workable within a building code

- **The design community (beyond those normally engaged by Seattle developers to deliver green buildings)** would also need to be on board with the requirements of the code in order that they could be fully prepared for its implementation. .

## LESSONS LEARNED

### PROS

- Cost effective policy – low program costs for the energy savings benefits, though high cost to developer.
- Will result in a wholesale move towards green building in the City.

### CONS

- Existing Seattle building standards will need to be reviewed.

### CONSIDERATIONS IN POLICY DESIGN

- Stringency of building requirements and the associated level of financial burden to impose on the developer industry?
- Should mandatory requirements be phased to reduce the economic / administrative burden on the City & developer?
- Will policy requirements contradict with State building code requirements? Should a green building code be adopted at State level prior to local implementation?
- If achieving exemplary green building performance is required across the board for all construction, how would we continue to promote the development of truly exceptional buildings to drive innovation?
- Suggestions for improvements to the Washington State Codes end on 31 March 2008 (for the next 3 year cycle). Therefore changes which may be affected by state policy should be submitted before this date.