

## **South Hillsboro High Performance Building Partnership Concept Paper**

In June 2015 the Hillsboro City Council adopted the City's first community Environmental Sustainability Plan (ESP), which represents one of the focus areas of the Hillsboro 2035 Community Plan. Three Goal Areas are defined in the ESP: Energy, Resource Conservation, and Resource Recovery and Renewal. The broad energy goals are to:

- Reduce community greenhouse gas emissions;
- Reduce use of non-renewable energy resources; and
- Expand use of renewable energy resources to meet demand.

Several goals and metrics in the ESP aim to track, measure and incent residential, commercial and industrial property owners to improve energy efficiency and reduce dependence on non-renewable energy sources.

Much of the energy efficiency work that is done takes place after the fact, to retrofit buildings that were not built to optimize efficiency. More buildings, such as the REACH multi-family/low income properties in Orenco Station and several single family residential projects in Hillsboro, are aiming to achieve a greater level of energy efficiency, but most still do not make efficiency a priority. For single family residential homes, there is arguably even more opportunity to design efficiency into new construction. Case studies show that designing and building to a higher efficiency standard not only benefits the homeowner through reduced utility bills and greater interior comfort, it benefits the developer/builder by distinguishing the efficient home in a competitive marketplace where more people than ever are concerned with energy efficiency and sustainability.

South Hillsboro represents a powerful and unique opportunity to meet these objectives on a large scale. Looking at the full plan area build-out, if high energy efficiency homes were built throughout, the savings estimated by the Energy Trust of Oregon could approach \$2.5M in homeowner utility costs, kilowatt-hours equivalent to 735 homes per year, therms (natural gas) equivalent to 633 homes per year, and nearly 14,000 tons of carbon emissions avoided.

*“South Hillsboro represents an unprecedented opportunity in Oregon – and perhaps the Pacific Northwest – to meet these objectives on a large scale.”*

Seeing this opportunity, City staff have been working with several key partners, including the Energy Trust of Oregon, Oregon Department of Energy, Earth Advantage, Portland General Electric, and SolarWorld to design a high performance building incentive program for new construction in South Hillsboro that packages existing incentives and includes new incentives for developers to incorporate into their designs. Specifically, program elements of the ‘South Hillsboro High Performance Building Partnership’ concept include the following incentives:

- Energy Trust of Oregon
  - Cash incentives based on energy efficiency above code for residential, commercial and multifamily buildings, including enhanced incentives for early design assistance.
  - Cash incentives for the installation of eligible solar electric systems.
  - Marketing/branding support throughout the development cycle.
  - No-cost training, engineering review and field support for advanced building practices and technologies.
  - Site verification, quality assurance and documentation of compliance to support 3<sup>rd</sup> party certification.
- SolarWorld
  - Support goal to make Hillsboro the most ‘solarized’ community in the U.S. by:
    - Offering Hillsboro-made SolarWorld residential solar kits and solar modules at a premium price based on total volume; and
    - Negotiating reduced rates with a preselected pool of experienced SolarWorld installation contractors that meet Energy Trust solar trade ally requirements through a “Solarize SoHi”-style campaign.
  - By connecting homebuilders with a small, prequalified group of SolarWorld installers through a Solarize campaign, SolarWorld will make it easy for builders to choose solar and ensure that all solar projects installed are eligible to receive available incentives and tax credits.
- City of Hillsboro
  - Provide to-be-determined relief and/or bonuses to developers that incorporate high efficiency design elements into new homes based on the Oregon REACH Energy Building Code.
  - Support marketing/branding of South Hillsboro “Complete, Connected and Green” aspects.
- Oregon Department of Energy
  - Provide incentives to developer/builder based on energy performance, to include tax credits or other available incentives.
  - Provide renewable energy tax credits at residential and community level projects.
  - Provide Renewable Energy Development Grants and low interest State Energy Loans.
- Portland General Electric
  - Provide incentives to developer/builder for installing smart, demand response enabled devices, including Nest thermostats, and potentially smart water heaters and batteries.
- Earth Advantage

- Support the program by linking the energy requirements in the Earth Advantage Certification levels (gold, platinum, zero-energy) to South Hillsboro development goals as represented in the Oregon REACH code.

The scenarios above could be utilized independently or jointly. If successful, this program would push high performance construction methods and technologies further toward standard practice, and could result in similar comprehensive building performance programs for other

*“The incentives are voluntary and mutually exclusive, making the path to high performance homes up to the developer and builder.”*

areas within Hillsboro and potentially within the entirety of the territory served by the Energy Trust of Oregon.

Table 1 below summarizes the current suite of incentives and options for the South Hillsboro High Performance Building Partnership. Further details are provided in the following narrative sections. The incentives are intended to support developers and builders in South Hillsboro to pursue high performance building design and implementation, to achieve the ‘green’ element for South Hillsboro through highly efficient built infrastructure. The incentives are voluntary and mutually exclusive, making the path to high performance homes up to the developer and builder.

### **City of Hillsboro**

The City anticipates a two-part approach to integrating this potential program with development in South Hillsboro.

1. Developers would work with the City and/or the applicable entity to deliver energy efficient buildings, photovoltaic panels and energy production facilities, and/or PGE pilot program components integrated with their development in exchange for lower construction/installation costs and monetary incentives such as tax credits, other third party incentives and/or reduced permitting fees.
2. Developers would utilize components of this incentive program as public benefit components of the developer’s Planned Unit Development submittal application. Under this scenario developers would commit to the provision of certain energy efficiency performance and components, or installation of solar panels or pilot program components in exchange for flexibility from Community Development Code standards such as density increases, design elements flexibility, and open space requirement reductions. The City would accept and condition implementation of the High Performance Building components and also provide certainty on the development standard flexibility sought by the applicant and allowed by the code.

Additionally, since 2007 the City has waived the building permit fees for renewable energy devices, including solar, and including electric vehicle charging stations.

## Energy Trust of Oregon (ETO)

Energy Trust of Oregon is looking forward to working directly with developers and/or builders to provide customized incentive packages based on their specific goals for incorporating energy efficiency and solar electricity into the South Hillsboro development. The incentives available are roughly broken into three categories: Residential, Commercial and Solar.

### Residential

Energy Trust of Oregon is offering up-front cash incentives for a commitment to establish a certain percentage of homes to be built to a minimum energy savings threshold. All incentives are based on percentage performance above the Oregon Energy Code. A portion of the incentives will be offered up-front, and the balance of incentives will be paid out upon verification of energy savings achieved post-commissioning.

Through its Energy Performance Score (EPS) program, the Energy Trust of Oregon is offering up-front cash incentives for a commitment to establish a certain percentage of homes to be built to a minimum energy savings threshold. All incentives are based on percentage performance above the Oregon Energy Code. A portion of the incentives will be offered up front, and the balance of incentives will be paid out upon verification of energy savings achieved post-commissioning.

EPS <sup>1</sup> Pathway	Percent above Code	2016 Incentive Level*
1	10%	\$480/home
2	20%	\$960/home
3	25%	\$1600/home
4	35%	\$3200/home
5	40%	\$4000/home

**Table 1: Energy Trust of Oregon EPS Incentives**

\*Currently subject to change, but will be locked in for 2-year time period upon program adoption

**Step 1:** Select an EPS Pathway baseline commitment (20% above code)

**Step 2:** Identify total units that will comply with baseline commitment

**Step 3:** Calculate upfront cash incentive

**Step 4:** Select an EPS Pathway stretch level commitment

**Step 5:** Identify goal number of units to reach stretch pathway

**Step 6:** Calculate cash-incentive payback opportunity upon completion of project

### Commercial, Multifamily, & Mixed-Use

Energy Trust supports the entire design and construction process for new buildings built to a high performance standard. Start by meeting with an Energy Trust outreach manager to establish a clear, measurable target and your outreach manager will then work with the project team to

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<sup>1</sup> Energy Performance Score (EPS) is an Energy Trust of Oregon incentive program for new residential construction.

develop a strategic approach to reaching that target and will help you determine which incentives and resources will most benefit your project, including:

#### *Early design assistance*

- *Project kick-off meeting:* An Energy Trust outreach manager will meet with the project team and guide you through the process of selecting a measurable target and energy-efficient design strategies to reach it.
- *Design Incentives:* Up to \$10,000 to offset the cost of a design charrette to refine target and goals. Projects that anticipate the use of solar may be eligible for an additional \$1,700 to conduct a solar assessment of your building.
- *Construction document review:* Energy Trust will review construction documents to ensure they align with the energy savings targets and strategies set during kick-off meeting and design charrette.

#### *Technical assistance*

- Energy Trust can provide 75 percent of the cost of energy studies, up to \$50,000. Studies may include, but are not limited to:
  - Shoebox modeling during early design;
  - Computational fluid dynamics (CFD) analysis;
  - Daylighting studies;
  - Energy modeling; and
  - Commissioning design review.

#### *Installation incentives*

- Energy Trust can pay up to \$499,999 for design assistance and equipment installation. Installation incentives are calculated using one of the following methods:
  - Modeled savings: \$0.40 per kWh, \$1.20 per therm;
  - Standard and/or special measure incentives; and
  - Market solutions “very best” level.

#### Solar Electric

The Energy Trust offers two types of incentives for solar in new construction: 1. incentives for designing and building “solar ready;” and 2. Incentives for installing solar. Energy Trust will support SolarWorld as they negotiate installation labor discounts with qualified solar trade ally contractors through a “Solarize SoHi” campaign that will make it easy for builders to include solar as an option and ensure that all solar projects installed in the South Hillsboro area are eligible to receive available incentives and tax credits.

- *Solar Installation Incentive:* Energy Trust provides incentives for the installation of a solar electric system – either with or without battery storage – on a home or building. The incentive amount depends on the current rate, the system size and site-specific eligibility criteria. Only qualified solar trade ally contractors can offer incentives. The Solarize SoHi

campaign that is being offered by SolarWorld in collaboration with Energy Trust would take advantage of SolarWorld's discounted equipment pricing to provide builders with upfront cost certainty and ensure that each installation meets all incentive requirements.

- **Solar Ready Design Incentive:** Installing a solar electric system at the time of construction is less expensive than retrofitting an existing building, and it often produces better performing systems. However, if it is not possible to install solar during initial construction, Energy Trust provides incentives for new residential and commercial construction that is built "solar ready." By designing for a clear solar roof space, installing conduit from the roof to the electric panel, and leaving room for future components of a solar electric system, flexibility and value are added to new homes and buildings. Energy Trust offers a variety of resources in addition to incentives to help build solar ready. Design incentives are available to incorporate battery storage into the solar electric system design.

## **SolarWorld USA**

SolarWorld, the largest solar photovoltaic (PV) manufacturer in North America, is one of Hillsboro's largest employers, with over 800 employees. SolarWorld is offering to provide equipment discounts based on total volume and to negotiate reduced rates with a preselected pool of experienced SolarWorld installation contractors that meet Energy Trust solar trade ally requirements through a Solarize-style campaign. By connecting homebuilders with a small, prequalified group of SolarWorld installers through a Solarize SoHi campaign, SolarWorld will make it easy for builders to choose solar and to ensure that all solar projects are eligible to receive available incentives and tax credits.

SolarWorld, with support from the Energy Trust, will manage a Solarize SoHi campaign and solicit quotes from qualified solar contractors for installing solar on residential, multifamily and commercial buildings within the Plan area. Based on volume targets for solar installations set by the developers and builders, SolarWorld will be able to set equipment pricing and obtain cost guarantees from the pool of prequalified solar installation contractors. This model provides builders both cost certainty and a limited range of choices to match their needs. The cost certainty comes from knowing the package price for the solar installation – including all labor – in advance. This is because the cost will be predetermined by SolarWorld once the builder chooses the appropriate system size for the specific residential or commercial building, and which of the prequalified SolarWorld installers they would prefer to work with to solarize their community. Beyond the equipment and technical assistance, SolarWorld will also provide marketing support throughout the development's lifecycle.

## **Oregon Department of Energy (ODOE)**

Existing incentives provided through the State Department of Energy include:

- Incentives to the developer or builder based on energy performance, to include tax credits or other available incentives;
- Renewable energy tax credits for single family and community-level projects; and
- Renewable Energy Development Grants and low interest State Energy Loans.

**Portland General Electric (PGE)**

Portland General Electric (PGE) is developing a number of programs that enable customers to earn rewards for using certain “smart” appliances that allow the customer to use energy more wisely. By installing these devices in new homes, developers enable future owners to pay significantly reduced energy bills and potentially increase the reliability of their power. The appliances typically also help the developer to achieve the efficiency levels needed to qualify for ETO and ODOE incentives.

- Today, the Nest Learning Thermostat qualifies for a \$50 upfront incentive from the Energy Trust, and then the customer can earn another \$75 in the first year if they have a heat pump and enroll in the program.
- By the end of 2017, PGE anticipates having a similar program for customers in single-family homes with heat pump water heaters, and we can identify models likely to qualify by the end of Q3 2016. Such water heaters may also qualify for ETO incentives and the state residential energy tax credit.
- PGE is interested in partnering with developers on a potential pilot program for select “smart energy homes” that include solar + energy storage, water heaters, heat pumps, and nest thermostats. We would like to partner with developers now for a pilot that would launch in 2018.

PGE would also market “carbon-free” communities, for neighborhoods that are all-electric in the home (heat pump; heat pump water heater; induction cooktop; EV charging port) and is interested in partnering with developers on this idea.

**Program Summary**

The South Hillsboro High Performance Building Partnership seeks to incent high performance building on a large scale. Table 2 summarizes the potential offerings and program elements described above. This document is considered ‘living’ and subject to amendment as incentives change and opportunities arise.

Entity	Incentive	2016 Incentive Level*	Notes
<i>Energy Trust of Oregon</i>			
	Marketing and branding support		Available throughout the development lifecycle
	Residential single family		
	Build to 10% above Oregon Code	\$480/home	
	Build to 20% above Oregon Code	\$960/home	

Entity	Incentive	2016 Incentive Level*	Notes
	Build to 25% above Oregon Code	\$1,600/home	
	Build to 35% above Oregon Code	\$3,200/home	
	Build to 40% above Oregon Code	\$4,000/home	
	Commercial, multi-family and Mixed use		Projects must be enrolled early in design process to qualify
	Early design assistance	Up to \$10,000/bldg.	
	Technical assistance	Up to \$50,000/bldg.	
	Installation incentives	Up to \$499,999/bldg.	
	Solar Electric		
	Solarize SoHi campaign coordination		Collaborate with SolarWorld and solar trade ally contractors to create and advertise the solarize campaign
	Solar-ready design incentives	\$200/home Up to \$1,700/bldg.	Typically paid to the contractor. Site-specific eligibility criteria apply
	Solar installation incentives	Up to \$5,000/home Up to \$135,000/bldg.	Typically paid to the contractor. Site-specific eligibility criteria apply
<b>City of Hillsboro</b>			
	Consideration of CDC requirement modifications	Various, depending on specifics	May include design and open space and other requirements in exchange for high efficiency building commitments
<b>Solar World</b>			
	Marketing and brand support		Available throughout the development lifecycle
	Discounted SolarWorld equipment	Exact discount determined by volume	Discounted equipment for both residential and commercial installations
	Solarize SoHi campaign coordination	Exact installation rate determined by volume	Negotiate installation costs and create pool of solar contractors to maximize incentives and installation quality
<b>Oregon Department of Energy</b>			
	Residential Energy Tax Credit – Solar Photovoltaic	\$1.50 per watt, up to \$6,000	\$1.50/watt for 2016, anticipated to be \$1.30/watt for 2017
	High Performance Homes	Tax credit – up to \$7,000 per home	
<b>Portland General Electric</b>			
	Nest smart thermostat	\$50 + up to \$75 for participating customers	
	Smart water heater	TBD	
	Smart Energy Home – solar + storage, water heater, and Nest thermostat	2018 launch	

**Table 2: Summary of High Performance Building Partnership Incentives**

\*Current incentives during program agreement period, subject to change thereafter



In addition to these direct incentives and benefits provided through the South Hillsboro High Performance Building Partnership, there are documented market premiums associated with the sale of high performance homes.

- A 2015 meta-analysis<sup>2</sup> of 20 market valuation studies shows that high performance homes that are marketed and sold with a certification sell for a 4.3% premium compared with non-certified homes. Recent studies<sup>3</sup> looking specifically at the Portland and Seattle markets have shown a similar result.
- A study of residential developments in the Northwest<sup>4</sup> indicates that these market premiums actually increase in down markets, suggesting that builders can hedge against depreciating markets by incorporating home certification into their development plans.
- A study<sup>5</sup> looking at homes in Portland, Oregon showed that they received an average premium for a solar photovoltaic system of \$10,600, accounting for roughly 3.25% of the price at a value of \$3.92 per watt. In Oregon, the premium exceeded the net cost of the solar energy system.

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<sup>2</sup> Brown, M.J. and T. Watkins. 2016.

[https://www.researchgate.net/publication/294090858\\_The\\_green\\_premium\\_for\\_environmentally\\_certified\\_homes\\_a\\_meta-analysis\\_and\\_exploration](https://www.researchgate.net/publication/294090858_The_green_premium_for_environmentally_certified_homes_a_meta-analysis_and_exploration)

<sup>3</sup> Northwest Energy Efficiency Alliance. 2015.

[http://www.earthadvantage.org/assets/documents/NEEA\\_Home\\_Valuation\\_Report-FINAL.pdf](http://www.earthadvantage.org/assets/documents/NEEA_Home_Valuation_Report-FINAL.pdf)

<sup>4</sup> Earth Advantage. 2014. [http://assets.energytrust.org/api/assets/reports/EPS\\_Solar\\_Valuation.pdf](http://assets.energytrust.org/api/assets/reports/EPS_Solar_Valuation.pdf)

<sup>5</sup> Adomatis, S. and B. Hoen. 2015. [https://emp.lbl.gov/sites/all/files/lbnl-1002778\\_fact\\_sheet\\_0.pdf](https://emp.lbl.gov/sites/all/files/lbnl-1002778_fact_sheet_0.pdf).

[https://emp.lbl.gov/sites/all/files/lbnl-1002778\\_presentation\\_0.pdf](https://emp.lbl.gov/sites/all/files/lbnl-1002778_presentation_0.pdf)

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