



**GreenTools Government Confluence:**  
THE "UNCONFERENCE" FOR IMPLEMENTING CHANGE  
IN YOUR JURISDICTION.  
CO-HOSTED BY CASCADIA REGION GREEN BUILDING COUNCIL.

Session:

**Getting Living Buildings on the Ground**

Presenters:

**Tim Jewett, Dykeman**  
**Brennon Staley, City of Seattle**  
**Dave Ramsle, City of Vancouver**

Date:

**May 5, 2010**



## Valley View Middle School

*Snohomish School District*

# Making the Case

Living Building Challenge | Green Tools Government Confluence

Bellevue, WA

**HEERY**

**DYKEMAN**  
INSPIRING EVERYDAY SPACES

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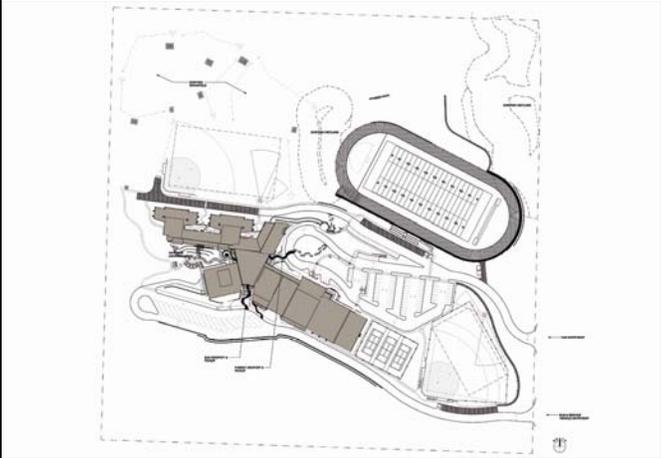
# Valley View Middle School

- 150,000 sf replacement school
- 38.8 acre wooded site
- On-site septic system
- Local water district service
- 6<sup>th</sup> thru 8<sup>th</sup> grades - 950 students
- Rural Snohomish County setting

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*Snohomish School District*



# Site Plan



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*Snohomish School District*



## Why District Considered LBC?

- “Capital Rich...Operationally Challenged”
- Operation budget cutting at all levels
- Reduce costs by reducing consumption
- Be fiscally responsible with Taxpayer \$\$
- “Walking to the end of the dock – tell me why I can’t get there”

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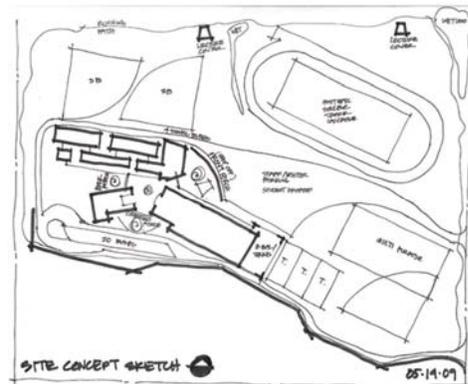
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## LIVING BUILDING CHALLENGE™ 2.0

“Sustainability means designing or creating a “living system” in such a way that it is ecologically stable and self renewing, with the result that it has a zero or positive (restorative) impact on the larger system to which it is a part.”

- Dr. William Mester,  
Snohomish School District Superintendent



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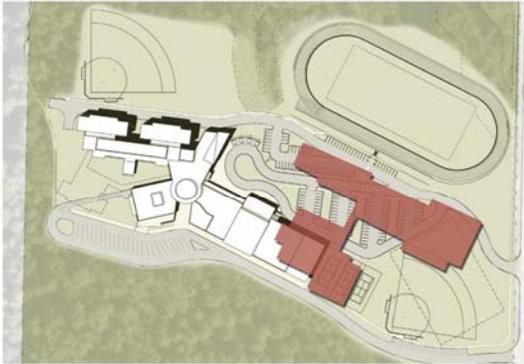
# Sustainable Practices Options – New to District

- Geothermal Heating / Cooling
- Increased Building Envelop Insulation
- Solar Panels Electrical Generation
- Utilize Storm Runoff for Irrigation
- Recycle Black Water for Toilet Flush
- Collect Rain Water for Potable Water
- Collect Rain Water for Toilet Flush

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*Snohomish School District*



## PETAL: Site



### STRATEGY:

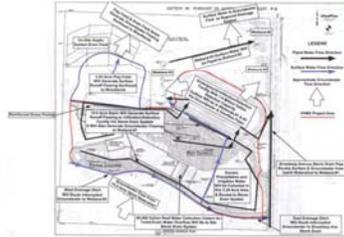
- Stay within existing limits of development
- Habitat exchange to occur onsite



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## PETAL: Water



### STRATEGY:

- Water flow
- Manage water use



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## Storm Water Runoff for Irrigation

- Collect storm water from site
- Store under playfield
- Use for irrigating new playfield
- Capital cost \$760,000
- Board Decision Do not accept – Not permanently irrigating landscaping

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## Collect Rainwater – Potable H2O

- Collect rain water from roof
- Treat, purify & store water
- Capital Cost is \$291,000
- Annual Savings is nil
- Water Rights issues resolved
- Board Decision – Do not accept – operating a public water system

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## Recycle Black Water for Toilets

- Waste water from building
- Treated by new tech. Septic
- Recycled to use for Toilet Flush
- Capital Cost is \$270,000
- Annual savings estimate \$1,500
- Board Decision - Do not accept – the “ick factor”  
traditional septic already on site

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## Collect Rainwater – Toilet Flush

- Collect rain water from roof
- Treat & Store water
- Capital Cost is \$291,000
- Annual Savings estimate \$2,250
- Board Decision - Accept

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## PETAL: Energy



STRATEGY:  
- Reduce demand  
- Produce energy onsite



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## Geothermal – Ground Source Loops

- Vertical Well Fields for Building Heat Load
- Good Soils Conductivity
- Elimination of Fossil Fuel Use
- Capital Cost increase approximate \$800,000
- Payback in approximately 15 years
- Board Decision - Accept

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## Increase Building Insulation

- Increase:
  - Wall Insulation Value increases
    - R-19 to R – 28 (30)
  - Roof Insulation Value increases
    - R-30 to R-54
  - Triple Pane Windows
- Capital Cost increase of \$328,000

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## Increased Building Insulation

- Minimize Energy losses through:
  - Increased Wall & Roof Insulation
  - Triple Pane Windows
- Eliminates 36 Geothermal wells
  - \$288,000 Well cost reduction
- Energy savings in addition to wells
- Board Decision – Accept – save costs of wells

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## P.V. Panels Electrical Generation

- \$7.5M cost for 1200KW total need
- Establish Agreement with local PUD
- Major Reduction in Electrical Bill
- Board Decision – Modify – too high capital cost – reduce size of array
- New Elementary Schools installing 100 KW arrays

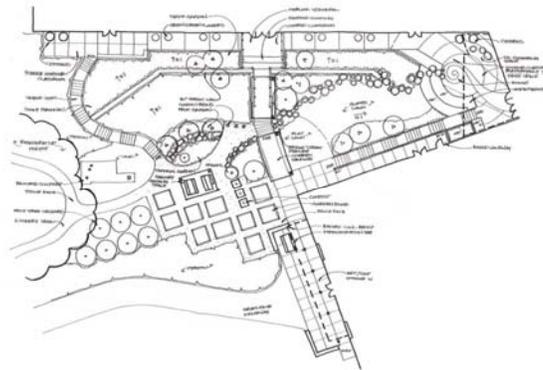
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**PETAL:**  
*Health*



**STRATEGY:**  
- Intuitive design



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**PETAL:**  
*Material*



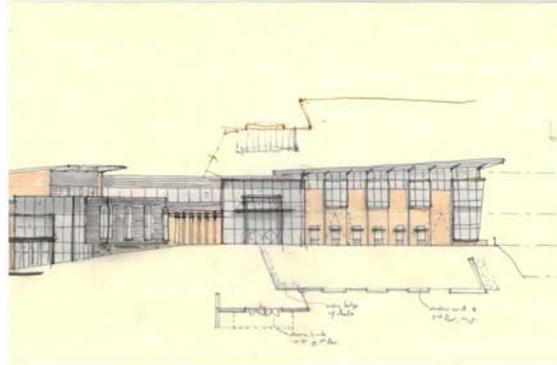
**STRATEGY:**  
- Local manufacturers  
- Local indigenous materials



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## PETALS: *Equity & Beauty*



### STRATEGY:

- Human scale detail
- Accessible interpretive wetlands
- Inspiring *kid-focused* environment



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## Design Current Status

- Living Building Challenge Goal
- Water Rights (rainfall) verified
- Pursuing Discounts for Solar
- Reduced Total Energy Use by 38+%
- \$26,000 annual energy reduction from current school energy costs
  - NOT including Solar Panels
  - Doubling the size of the current school
- Land Use and Building Permitting have been exactly the same as a typical school project

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Tim Jewett, AIA  
*principal*  
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City of Seattle  
Department of Planning  
& Development

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# Getting Living Buildings off the Ground

GreenTools Government Confluence – May 5, 2010

**Brennon Staley**  
Sustainable Communities Planner, Seattle DPD

**David Ramslie**  
Sustainable Development Program Manager,  
Vancouver BC

**Tim Jewett, AIA, CEFP**  
Principal, Dykeman



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## THE METAPHOR OF THE FLOWER

### ROOTED IN PLACE AND YET:

- Harvests all energy + water
- Is adapted to climate and site
- Operates pollution free
- Is comprised of integrated systems
- Is beautiful



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### TWO RULES

1. All Imperatives assigned to a Typology are mandatory.
2. Living Building Challenge certification is based on actual, rather than modeled or anticipated, performance.



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### Imperative Overview

- **20 Imperatives**
- **8 Sections**
  - **SITE**
  - **WATER**
  - **ENERGY**
  - **HEALTH**
  - **MATERIALS**
  - **EQUITY**
  - **BEAUTY**



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Our mission is to make **green building standard practice**

- tools & education
- technical assistance
- code & policy development
- research & evaluation

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**green PERMITTING**

Expedition

**green queue** Residential Deconstruction Permits

Facilitation

**PRIORITYGREEN PERMITTING**

Innovation

Living Building Pilot

**INNOVATION** Advisory Committee





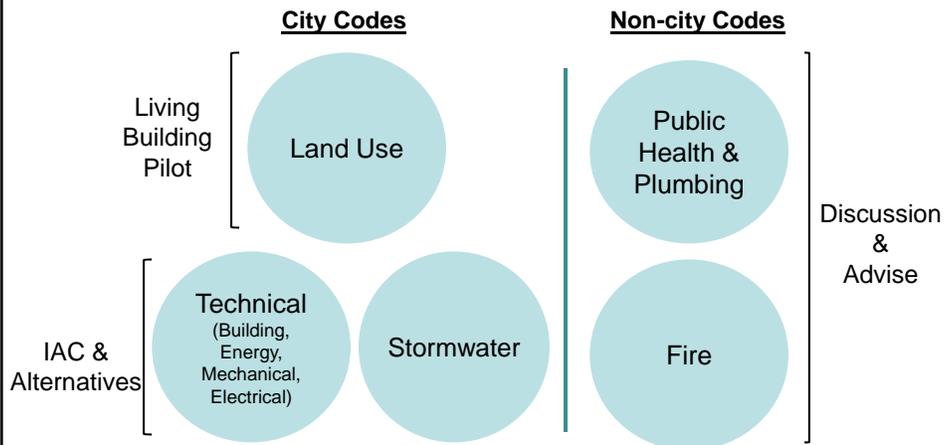

## Emerging Trends

- Integrated design
- Innovative design approaches
- New products

Eco-laboratory  
Image courtesy of  
Weber Thompson Architects



## Accommodating Innovation





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### Living Building Pilot Program

Provides flexibility in the application of the Seattle Land Use code to facilitate the development of buildings meeting the Living Building Challenge



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### Living Building Pilot Program

#### Enrollment

- Limited to 12 projects over 3 years
- Projects must be eligible for design review
- Requires plan demonstrating how they will meet each imperative of the Living Building Challenge
- Contact Jess Harris, DPD Green Permitting Lead, to apply





## Living Building Pilot Program

### Review Process

- Departure request considered through Design Review Board
- Enhanced pre-submittal conference to identify issues
- Meeting with Technical Advisory Group to discuss departure request → Technical Advisory Group supports DR board in decision



## Living Building Pilot Program

### Departure Criteria

- Allows departures from: accessory uses standards, residential density limits, floor area ratio (up to 15%), height (10 ft + rooftop features), parking, street/alley requirements, etc.
- Land Use Code only
- Standard: “the departure would result in a development that better meets the goals of the Living Building Challenge and would not conflict with adopted design guidelines”
- Height measurement flexibility





## Living Building Pilot Program

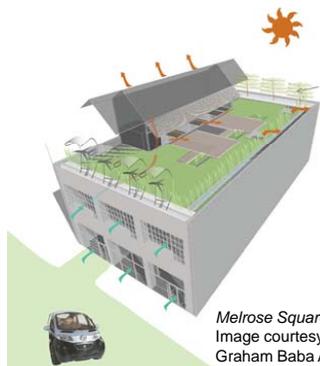
### Minimum Requirements

- For projects receiving departures only
- LBC certification or the following:
  - 60% of LBC prerequisites
  - Energy use 25% of comparable building
  - Water use 25% of comparable building
  - 50% of stormwater must be captured and uses onsite
- Penalties up to 5% of construction value



### Cascadia Center

- Higher floor plates vs. atrium
- Exterior photovoltaics



### Other Considerations

- Land use – agriculture, combined production
- Exterior water collection systems
- Exterior ventilation systems
- Floor area - living machines, composting
- Solar orientation

# INNOVATION

## Advisory Committee



- Convenes mechanical and electrical engineers with experts in sustainable technologies as needed
- Provides early review of new technologies to evaluate alternative compliance pathways
- Allows collaborative review
- Allows inclusion of outside experts
- Creates record of decisions

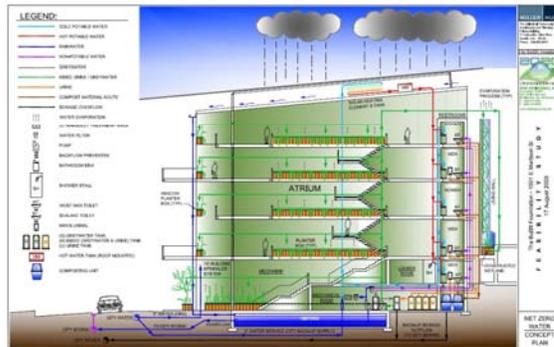
## Non-city codes

### Key Challenges

- Regulatory process
- Pricing structure

### Projects

- Blue Paper: Road Map to Water Independence
- Assistance to applicants





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### Other Green Building Programs

- Zoning Incentive Provisions
- Sustainable Development Policy
- Green Code Development
- Historic Preservation Green Lab
- Sustainable Infrastructure
- Sustainable Communities Planning
- Construction & Demo Waste Diversion
- Energy Disclosure Ordinance
- Electric Vehicle Infrastructure
- Technical Assistance



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### Brennon Staley

Sustainable Communities Planner  
Seattle Department of Planning and Development

[brennon.staley@seattle.gov](mailto:brennon.staley@seattle.gov)

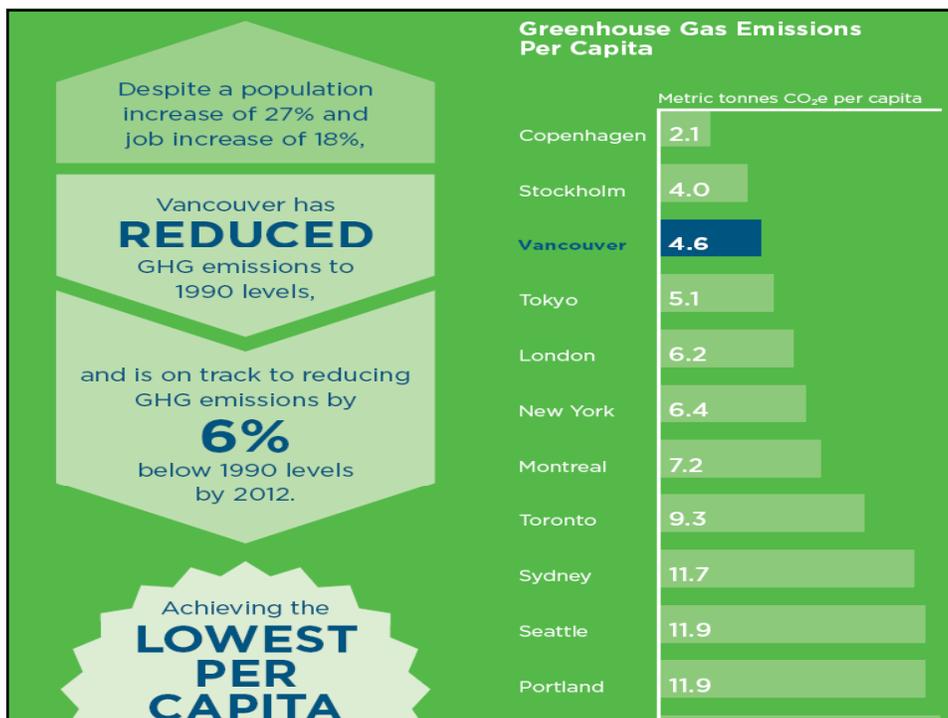
(206) 684-4625



## The Challenge

# GREENEST CITY IN THE WORLD BY 2020

In early 2009, the City's Mayor formed the Greenest City Action Team (GCAT) with a mandate to make recommendations on how Vancouver can become the greenest city in the world by 2020.

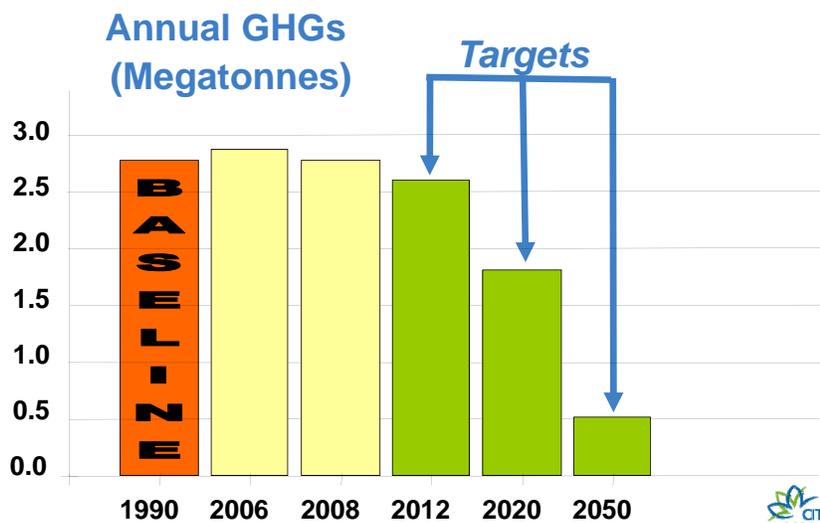


## A Bright Green Future



- 2010** Municipal operations emissions — reduce 20% (achieved)
- 2012** Carbon neutral municipal operations  
Reduce community emissions by 6% (on track to achieving)
- 2020** Reduce community emissions by 33% to 2007 levels
- 2030** All new buildings are carbon neutral
- 2050** Reduce community emissions by 80%

## Community GHG Emissions and Targets



Civic Facility Leadership Since 2003

LEED Gold Required - with 6 Energy points



Civic Facility Leadership Since 2003

LEED Gold Required - with 6 Energy points



Civic Facility Leadership Since 2003

LEED Gold Required - with 6 Energy points



Civic Facility Leadership Since 2003

LEED Gold Required - with 6 Energy points



## Going beyond our own standards

- LEED Platinum



## Going beyond our own standards



## Largest Portfolio of LEED Gold or better in Canada

- 2 million square feet of LEED or Platinum

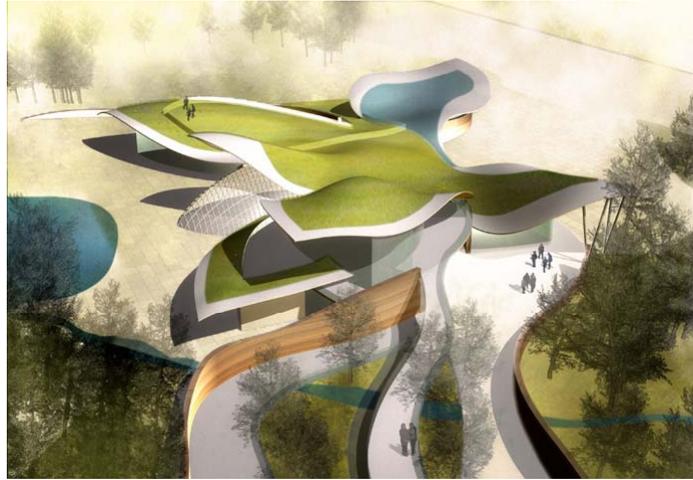


## We are now building NET-ZERO...

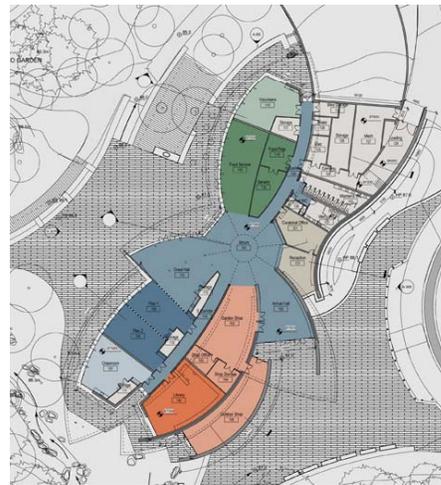
- Canada's first Net-Zero Multi-Family



## Living Buildings



## Living Buildings



## Lead by Example

- Builds Capacity (in staff and industry)
- Contributes to Economic Development
- Reduces Operating Costs
- Tests Policy
- Generates good media
- Live your values

### Passive Design Toolkit BEST PRACTICES



### Passive Design Toolkit BEST PRACTICES FOR HOMES



## Improve Public Awareness of the issues



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## The Challenge

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