



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

Session:
Eco-Districts and District Energy

Presenters:
Rob Bennett, Portland Sustainability Initiative
Stan Gent, Seattle Steam

Date:
May 5, 2010



The EcoDistricts Initiative

Accelerating Sustainability at the District Scale





WHO ARE WE

- Cross sector of business, government, academia, and NGOs
- High leverage projects
- Innovative public policies and financial strategies
- Learn from and contribute to global best practices



APPROACH | OUTCOME

1. whole systems integration | optimized sustainability benefits
2. speeding investment cycles | business development
3. policy breakthroughs | long term institutionalization
4. monitoring, documentation, engagement | learning networks





INITIATIVES

- Climate Prosperity
- Oregon Sustainability Center
- EcoDistricts



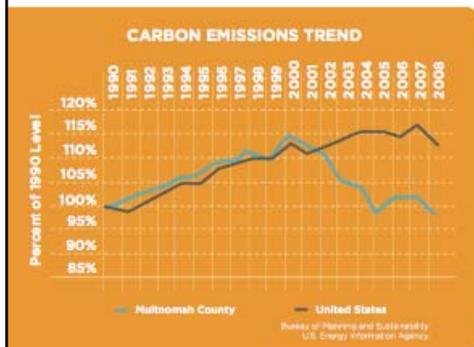
what ECODISTRICTS



- Comprehensive approach to neighborhood development – at the intersection of buildings, infrastructure, and people
- District with broad commitment to accelerate neighborhood scale sustainability



drivers ECODISTRICTS



- Urbanization – climate change, pollution & increasing urban population growth
- Infrastructure – cities need smarter and cost effective infrastructure strategies
- Integration – Economic development and social benefits
- Scale – neighborhoods as the building blocks of cities

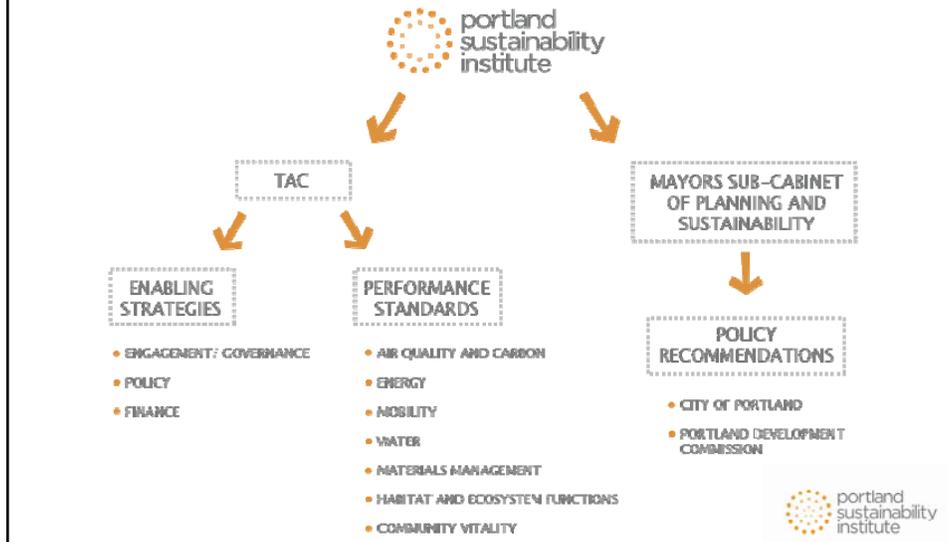


values ECODISTRICTS

- A place that values diversity and encourages participation
- A place with the lowest possible environmental footprint
- A place that supports health and wellbeing
- A pedestrian-oriented neighborhood with access to nature and open space
- A place that cultivates conservation and stewardship
- A place that provides options for walking, cycling, and transit to meet basic needs



who ECODISTRICTS



project precedents ECODISTRICTS

- Bo01 (Malmo, Sweden)
- Ekostaden Augustenborg (Malmo, Sweden)
- Dockside Green (Victoria, Canada)
- Southeast False Creek (Vancouver, Canada)
- Treasure Island (San Francisco, California)



program precedents

ECODISTRICTS

- Sustainable Communities Research (China)
- Climate Benefit Districts (Washington State)
- EcoCity Cleveland (Cleveland, OH)
- Living City Block (Denver, CO)



who

ECODISTRICTS

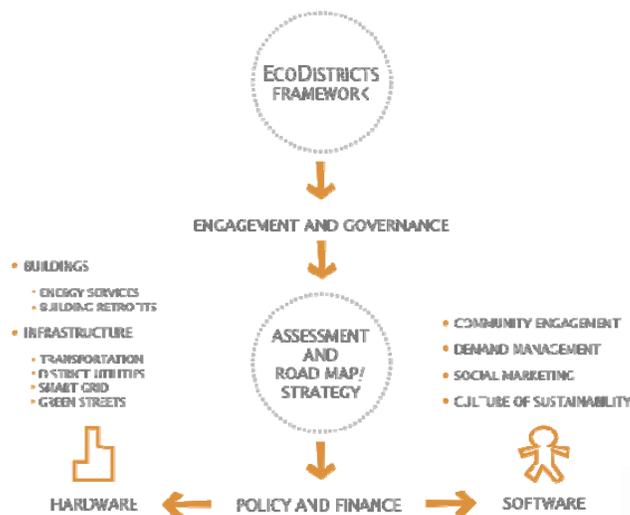


posi role ECODISTRICTS

- Creating a framework and pilot implementation strategy for metro Portland
- Developing an implementation toolkit
- Providing technical assistance to district stakeholders in conducting district assessments and structuring local governance
- Assessing the viability of distributed utilities and other key “catalytic” infrastructure and redevelopment projects
- Creating an inclusive and transparent technical review process



the roadmap ECODISTRICTS



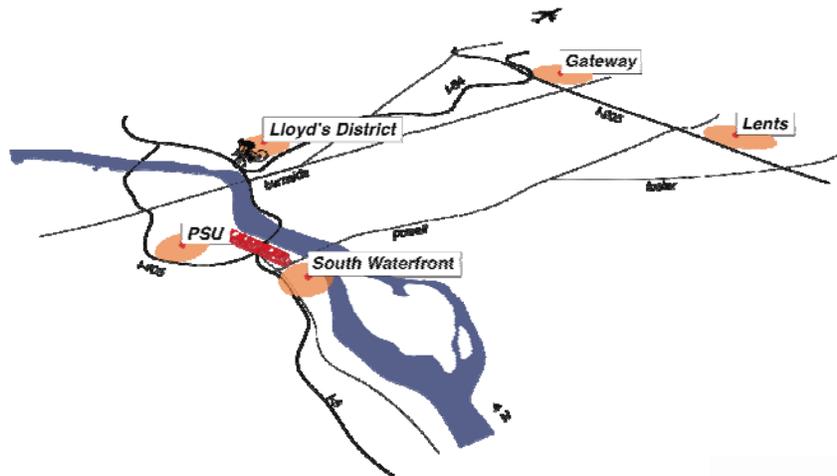
performance areas ECODISTRICTS



- Community Vitality
- Air Quality & Carbon
- Energy
- Mobility
- Water
- Habitat & Ecosystem Function
- Materials Management



pilot districts ECODISTRICTS



toolkit ECODISTRICTS

Assessment

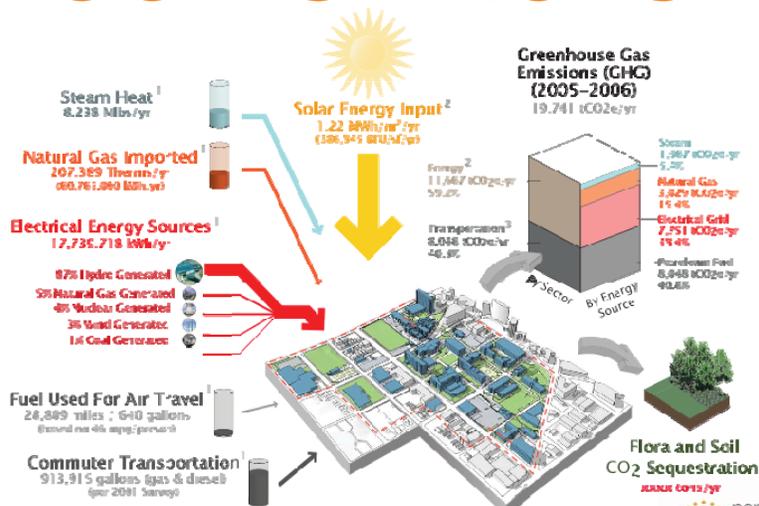
- Performance areas
- Baseline metrics – existing and future
- Project weighting protocols

Implementation

- Engagement & governance models
- Project feasibility
- Financing mechanisms
- Policy recommendations



assessment ECODISTRICTS



Diagrams courtesy of Mithun



economics

ECODISTRICTS



GHG Benefits

- 6,200 tons per year GHG reductions represent 65% of reductions necessary to achieve GHG neutrality in the SEFC ODP area.
- Significant contribution to the Community Climate Change action plan goals

Economic Returns

- 7.2% return compares favorably with the City's cost of debt of approximately 4% (real rates of return)
- Compares favorably with 6.3% pre-tax returns allowed to utilities regulated by the BCUC.



implementation

ECODISTRICTS

- Engagement & governance
- Project feasibility
- Project implementation
- Certification?
- Ongoing management & monitoring



potential strategies - hardware ECODISTRICTS

Thermal Energy



Water Reuse



Smart Grid



Green Streets



Diagrams courtesy of ZGF Architects



potential strategies - software ECODISTRICTS



Weatherization



Energy Competition



Bulk Purchasing



governance ECODISTRICTS

Barrier

Lack of governance and organizational capacity at district scale to drive work, knit together partners, identify reliable funding streams, select projects, monitor results

Precedents

- LIDs
- BIDs
- TMA/Parking Benefit Districts
- Cooperatives

Proposed Strategy

- Sustainable Management Association



finance ECODISTRICTS

Barrier

Project and district scale finance

Precedents & Proposed Strategies

- Parking Benefit Districts
- PACE/On Bill
- Green Energy Investment Trust
- Climate Benefit Districts
- EE Portfolio Finance



policy ECODISTRICTS

Barrier

There is limited policy support at the municipal, utility and state level for EcoDistrict implementation

Precedents & Proposed Strategies

- Enabling legislation for cities and public districts (e.g. schools - Idaho) to develop distributed utilities (City of Vancouver)
- Enabling legislation allowing districts to collect revenue
- Redevelopment requirements (City of Vancouver, Copenhagen)
- Incentives (e.g. Business Energy Tax Credit, Feebates)
- Outcome based codes



recent highlights ECODISTRICTS



Thank You

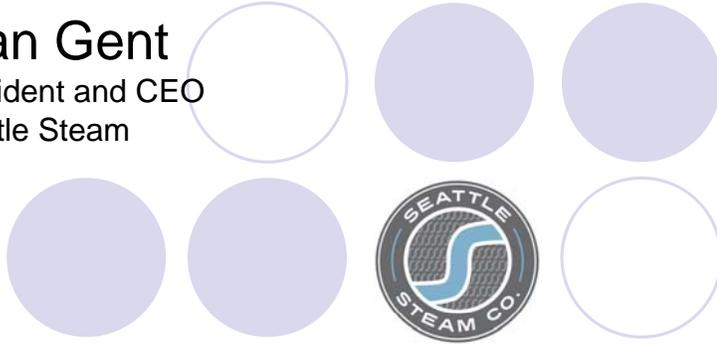
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Eco-Districts and District Energy

Stan Gent

President and CEO
Seattle Steam



3rd Annual King County GreenTools Confluence
May 5, 2010

What is District Energy?



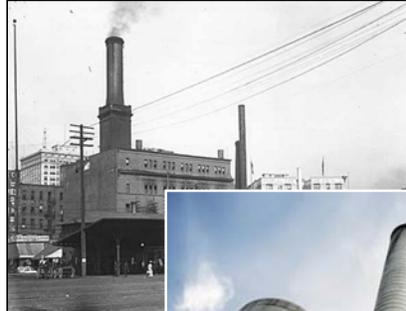
[Click here to watch the short movie about District Energy.](http://www.youtube.com/watch?v=JcN8AODnVDI)

Or copy this into your browser:
<http://www.youtube.com/watch?v=JcN8AODnVDI>

Seattle Steam Company

Serving 200 Buildings in Downtown Seattle

- Utility Service Since 1894
- Operated a 5MW (coal fired) combined heat and power plant at Post St. Plant
- Operated one of the nations first pulverized coal plants in 1913
- Electricity for heat in the 50's and 60's
- Conversion to nat. gas and oil after war
- Biomass (renewable) fuel in 2010
- CHP (waste heat recovery) in 2013 – perhaps!



District Energy in Seattle

Our customers represents about 7% of the energy consumed in the City of Seattle

Our Customers:

- 2 University Campuses
- 3 Major Medical Centers
- 6 Cultural Centers
- 6 Federal Facilities
- 11 Local Government Facilities
- 17 Hotels
- 16 Million (est.) sq ft of commercial space
- 200 Total Buildings

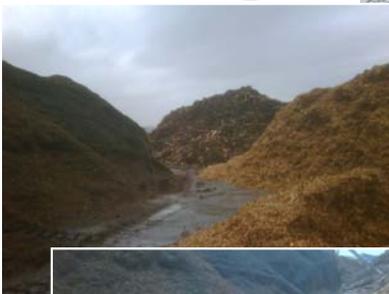


How do we create our Energy?



- Yesterday: 99% gas and 1% oil
- Today: 60% biomass, 39% gas and 1% oil – 60% reduction of carbon emissions
- Tomorrow: If CHP is economic, 60% biomass, 30% waste heat recovery, 9% gas and 1% oil. – 90% reduction of carbon emissions.

Wood Supply



Different suppliers deliver wood from a variety of wood sources:

- Land Clearing
- Urban Wood
- Composted wood
- Forest residue



Energy-Efficiency Comparisons

Standard Power Plant

100% Fuel Input



60% "Waste" heat rejected to environment

40% Useful energy produced for electricity

District Energy/ Combined Heat and Power Plant

100% Fuel Input



20% "Waste" heat rejected to environment

40% Useful energy produced for heating and/or cooling via district energy system

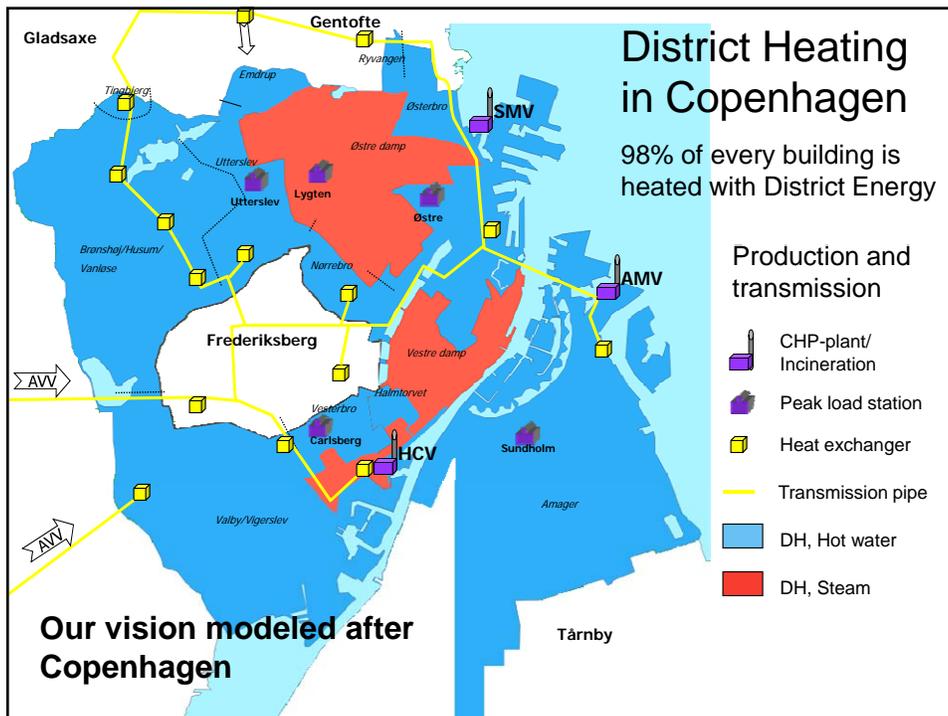
40% Useful energy produced for electricity

District Energy Opportunities

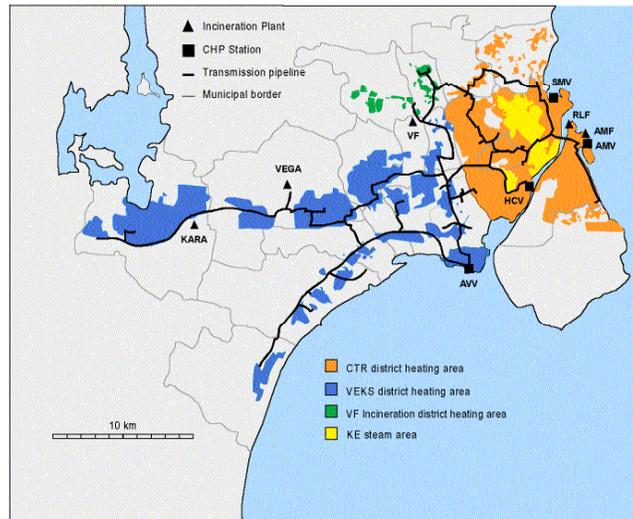


Our vision modeled after Copenhagen

- **Waste** heat recovered from incineration: 20%
- **Waste** heat recovered from biomass power generation: 20%
- **Waste** heat recovered from generation of electricity from natural gas: 25%
- **Waste** heat recovered from other sources: 34%
- Peak heating burning fuel directly: 1%



District Heating in the Metropolitan Region in Copenhagen



Barriers to District Energy

- Capital Intensity drives a need for low cost of debt; tax exempt bonds are available for piping and customer connections
- Certainty of “critical mass” customer base is needed to raise capital
- Should piping infrastructure be part of the community infrastructure, perhaps the same as water and sewerage?
- In advance of a carbon value determination, it is a challenge to meet customer savings needs. Conversion from a commodity based financial model to a capital based one is difficult for many property owners that have to compete for tenants.

Contact Information

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Sustainably Reliable