The Samuel Neaman Institute Energy Forum
Haifa Israel
26 October 2009

Case Studies of Local Government Energy Efficiency Initiatives

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How Can Cities Advance Energy Efficiency

Cities have a central role to play in tackling climate change, particularly as cities bear a disproportional responsibility for causing it. In fact, cities and urban areas consume 75% of the world's energy and produce up to 75% of its greenhouse gas emissions. That is why it is so important for cities to work together, set the agenda, and show leadership on this issue.

A group comprising of the world's largest cities, from North to South America, from Europe to Asia and from Africa to Australia, named the 'Large Cities Climate Leadership Group' or the 'C40', committed to tackling climate change.

Through effective partnership with the 'Clinton Climate Initiative' C40 will help reduce carbon emissions and increase energy efficiency in large cities across the world.

What can Cities Do?

- Creating **building codes** and standards that include practical, affordable changes that make buildings cleaner and more energy efficient.
- Conducting **energy audits** and implementing retrofit programs to improve energy efficiency in municipal and private buildings.
- Installing more energy efficient **traffic systems**-bus rapid transit and non- motorized transport systems, congestion charges etc/
- Installing more efficient **street lighting.**
- Implementing **localized, cleaner electricity generation systems.**
- Using **clean fuels** and hybrid technologies for **city buses, garbage trucks**, and other vehicles.
- Creating **waste-to-energy systems at landfills.**
- Improving **water distribution systems and leak management.**

Solar PV on building
(copyright Greenpeace/Davison)

Micro Wind Turbine and cowling for passive ventilation system. Bedzed, London, UK

(copyright Greenpeace/Davison)

Examples of what a few cities around the world are doing

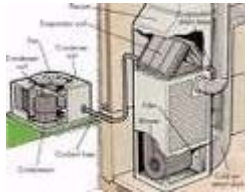
ENERGY

• Amsterdam, The Netherlands:

Lake water air conditioning cuts CO2 emissions by 70% compared to conventional cooling.

Summary:

By using a natural resource (cold lake water), Nuon Energy is able to produce 60 MW of cooling and provide air conditioning to businesses throughout Amsterdam City's south district while reducing CO2 emissions by 70% compared to conventional cooling methods.



• Copenhagen, Denmark:

97% of Copenhagen city heating supplied by waste heat.

Summary:

The Copenhagen district heating system is one of the world's largest, oldest and most successful, supplying 97% of the City with clean, reliable and affordable heating. The system simply captures waste heat from electricity production – normally released into the sea – and channels it back through pipes into peoples' homes. The system cuts household bills by 1,400 EUR annually and has saved Copenhagen district the equivalent of 203,000 tons of oil every year - that's 665,000 tons of CO2.

ENERGY (cont.)

Houston, Texas, USA

Free energy retrofits saving poorer homes $335 and slashing 1,100 tons CO2 per year.

Summary:

Houston's retrofitting program has dramatically reduced the consumption of energy in 641 homes in poorer communities through simple energy efficiency improvements, such as weather stripping windows and doors, insulating attics and hot water pipes, and caulking windows. It has cut 1,100 tons CO2e emissions and improved the lives of many families, saving them $870 USD annually.

• Melbourne, Australia

Melbourne has reduced CO2 emissions by 1.1million by making energy mandatory.

Summary:

Melbourne has been reducing carbon dioxide emissions by 1.1 million tons and saving companies $34 million every year, by simply requiring large greenhouse gas emitters to complete audits and implement sustainable actions that can be paid back in three-years. The focus on economic return has delivered immediate and sustained reductions in consumption and CO2 emissions. Its success means it will be expanded beyond energy to also address water and waste, and applied to other companies.

TRANSPORT

• Portland, Oregon, USA

Optimizing traffic signal timing significantly reduces the consumption of fuel.

Summary:

The City of Portland has optimized traffic signal timing at 135 intersections on 16 streets in Portland. This optimization work has resulted in saving motorists over 1,750,000 gallons of gas each year. This reduction in gas consumption is equivalent to 15,460 tons of CO2 each year.

• Freiburg, Germany

A city powered by solar, where a third of all journeys are by bike.

Summary:

Since the 1970s Freiburg has developed a reputation as Germany's ecological capital. By 1986 the City had a vision for a sustainable city reliant on an ecologically-oriented energy supply, today its solar, energy efficiency and transport programs are among the best in the world. Over 10 years CO2 emission have been reduced by more than 10% per capita, there has been a 100% increase in public transport use –35% of residents choosing to live without a car Freiburg

BUILDINGS

• Heidelberg, Germany

Energy efficiency buildings in Heidelberg reduces emissions.

Summary:

Heidelberg is at the forefront of environmental protection in Europe and has cut CO2 emissions by over 15,000 tons per year in municipal buildings since 1993. The city has developed a comprehensive energy management system for local authority properties and has been involved in a wide range of projects for sustainable development. From 1993-2004, CO2 emissions from municipal buildings and university facilities (1999- 2002) were reduced by 35% and 13% respectively. The city uses civic forums to ensure community participation and aims to cut CO2 emissions by 20% before 2015.

• Melbourne, Australia

Council House 2 (CH2) new municipal office building: eco-buildings cuts C02 87%, electricity 82%, gas 87% and water 72%.

Summary:

Melbourne Council House 2 is a multi-award winning building that has reduced CO2 emissions by 87%, electricity consumption by 82%, gas by 87% and water by 72%. The building purges stale air at night and pulls in 100% fresh air during the day. The building exterior moves with the sun to reflect and collect heat, and turns sewage into usable water. The building has improved staff effectiveness by 4.9% and will pay for its sustainable features in a little over a decade.

LIGHTING

• Ann Arbor, Michigan, USA

LED street lighting pilot project reduces energy use by 80%.

Summary:

In 2005, Ann Arbor established a moratorium on new street lighting aimed at helping keep costs under control. As part of this cost cutting initiative, the City began trialing LEDs for general lighting purposes. LEDs reduce lighting energy requirements by 50% or more, but their greatest benefit is that they last much longer than conventional bulbs, reducing labor and maintenance costs. In Ann Arbor, this will translate to annual CO2 reductions of 2,200 tonnes and annual savings of @$100 per fixture.

• Oslo, Norway

10,000 Intelligent streetlights save 1440 tCO2 and reduce energy consumption by 70%.

Summary:

Oslo has reduced energy consumption by 70% and CO2 emissions by 1440 tonnes per year by introducing an innovative and energy-efficient form of street lighting. 10,000 high-pressure sodium lights using an "intelligent lighting" system that adjusts light according to need have been introduced around the city.

U.S. DOE Energy Efficiency and Conservation Block Grant Program (EECBG)

The Energy Efficiency and Conservation Block Grant Program (EECBG) provides grants to projects that reduce energy use and fossil fuel emissions and improve energy efficiency.

The program represents a Presidential priority to deploy the cheapest, cleanest, and fastest energy sources.

EECBG was signed into law on December 19, 2007 and is administered by the Department of Housing and Urban Development (HUD).

The purpose of the Program

To assist eligible entities in implementing strategies –

1. **To reduce fossil fuel emissions created as a result of activities within the jurisdictions of eligible entities in a manner that –**
   - **Is environmentally sustainable; and**
   - **To the maximum extent practicable, maximizes benefits for local and regional communities.**
2. **To reduce the total energy use of the eligible entities; and**
3. **To improve energy efficiency in –**
   - **The transportation sector;**
   - **The building sector; and**
   - **Other appropriate sectors.**

Chicago's "Guide to Completing an Energy Efficiency and Conservation Strategy", February, 2009

Following the creation of its own "Climate Action Plan" (December 2008), the city of Chicago has developed the, so called, "*Chicago's Guide to Completing an Energy Efficiency and Conservation Strategy*" aiming to help other cities develop Their own long-term and sustainable energy efficiency and Conservation strategy, providing not only a roadmap for reducing energy use, but also for lowering government, business, and resident energy costs, and promoting economic development and job creation.

The Guide Provides:

- Model Plan Outline
- Planning Process Guide
- Analysis and Prioritization
- Structures for Input and Advise
- Execution Options
- Additional Steps to Completing a Climate Action Plan
- Additional Steps to Completing a Green Jobs & Economic Development Plan
- Where to go for Resources and Help
- Template for an Energy Efficiency and Conservation Plan RFP
- Methodology for Calculating Baseline Energy Use and Greenhouse Gas Emissions
- Developing a Large-Scale Building Energy Efficiency Retrofits Strategy

http://chicagoclimateaction.org/filebin/pdf/ChicagoGuidetoCompletingAnEnergyEfficiencyandConservationStrategy.pdf

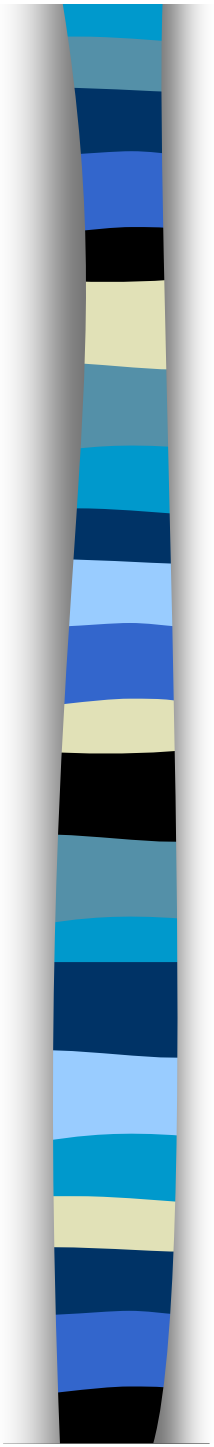
On October 19, 2009, U.S. Vice President Biden unveiled a report by the 'Middle Class Task Force' of the 'Council on Environmental Quality' titled 'Recovery Through Retrofit' which is "a blueprint… that will be the cornerstone of a 21st Century economy… making it easier for American families to retrofit their homes – helping them save money while reducing carbon emissions and creating a healthier environment".

The report points out that existing techniques and technologies in energy efficiency retrofitting can reduce energy use by 40% per home, lower greenhouse gas emissions in the U.S. by up to 160 million tons annually, and potentially cut home energy bills by $21 billion each year. Yet, lack of access to information, to financing and to skilled workers have presented barriers to a self sustaining retrofit market. Addressing these issues, some of the report's recommendations are as follows:

- **Provide homeowners with straightforward, reliable home energy retrofit information:**
  - **Develop 'Energy Performance' label for homes, similar to the 'ENERGY STAR' label for appliances that helps consumers identify efficient products.**
  - **Establish a standardized home energy performance measure applicable to every home in America which will make it easier for consumers to understand how much they can save by retrofitting their homes.**

- **Reduce high upfront costs and make it easy for homeowners to borrow money or home energy retrofits.**
  - ➢ **Support Municipal Energy Financing by allowing the costs of retrofits to be added to a homeowner's property tax bill. This arrangement attaches the costs of the energy retrofit to the property, not the individual.**
- **Mobilize a well-trained national energy retrofit workforce and expand good green job opportunities for all American workers.**
  - ➢ **A uniform set of national standards to qualify energy efficiency and retrofit workers and industry training providers will establish the foundation of consumer confidence that work will be completed correctly and produce the expected energy savings and benefits.**

These recommendations do not involve spending large new sums of Federal dollars. Rather, they focus on removing information barriers, transaction costs, liquidity constraints, and other market failures that often prevent homeowners from making investments that have both private and social benefits.



Thank You
for Your Attention

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