
DISTRIBUTED ENERGY

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Impacts

- Peak electric and gas load reduction
 - Less distribution & transmission infrastructure
 - Less generation
- Pollution reduction Solar
- GHG reduction
- Environment – Energy & Transportation are major impacts
- Solutions must cross traditional boundaries



Connected smart energy systems

- Not just smart grid
- DG
- Renewables
- Demand response
- Fuel switching – gas, solar hot water
- Transmission grid, Distribution grid, Home, Vehicles
- Control of all demand response by utility is critical to achieve benefits for all the connected subsystems

New technologies

- Enbridge –
pressure reducer
generator
combined with fuel
cell
- Marshall Homes
Oshawa
- Halton Hills Hydro

Fuel Cell Basics

Large stationary fuel cells can operate directly on natural gas, converting the natural gas to hydrogen internally and converting hydrogen and oxygen efficiently into electricity. With a continuous supply of natural gas, fuel cells are like everlasting batteries.



Solar Hot Water Heat

- Tokyo 1.5M buildings with solar water heaters
- Israel 30% of buildings with solar hot water
- Water heating produces an average of 2 tonnes of CO₂ per year per household.
- Solar + electric, solar + gas or solar + both – what is the right answer?



Transportation

- Big diesel generators running all day long
- Electrification of train system
- Plug in hybrid bus or utility vehicle
- What are the impacts?



North America's first Plug in Hybrid Solar Electric Vehicle



- Solar on roof
- Off peak battery charging
- Future emergency home back up and grid support

Questions



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