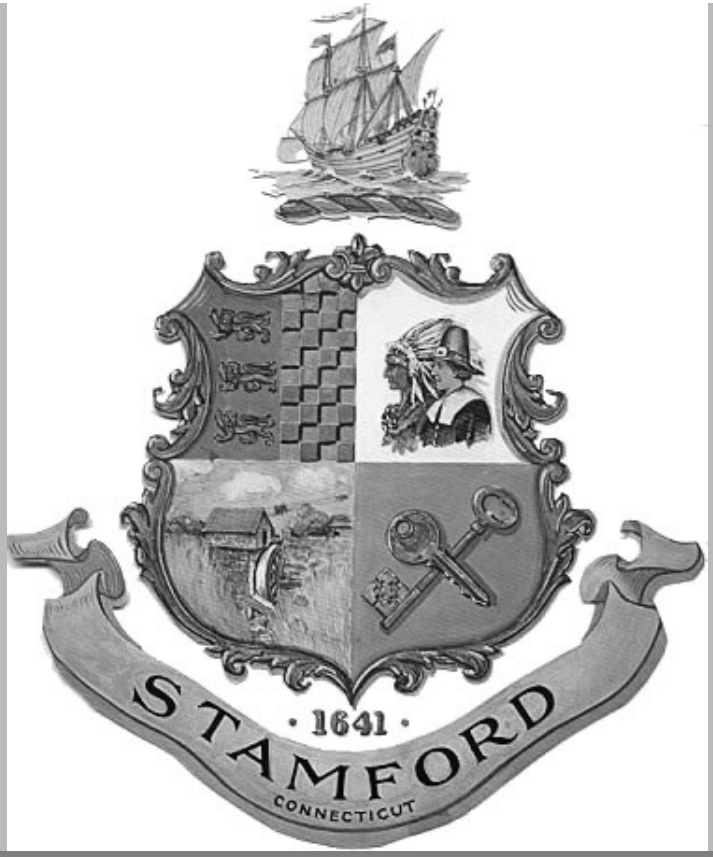


PROGRESS REPORT ON CHP DEVELOPMENT IN STAMFORD

Presentation to:

US Environmental Protection Agency

Stamford: The City that Works

Population 122,000

Located in Metro NYC area

CT's commercial/financial center

Downtown Concentration of Financial & Other Offices

The UBS Trading Floor

Sustainable Stamford

- Mayoral Initiative 2007
- Focus on clean energy, solid waste/ recycling goals, vehicle fleet efficiency, green procurement
- ICLEI membership
- Climate Communities, founding member
- TOD at city's 3 rail stations
- LEED – local ordinance, state code, land

Energy as An Economic Development Matter

- Highest-cost electric power in continental U.S.
- 1 of 4 national problem areas for electric reliability
- Recent energy disruptions, brownouts
- Capacity of grid to meet commercial growth
- Capacity-Reliability-Costs-Quality-Green

Connecticut Power Issues

- CT has shortfall of installed capacity of at least 700 MW with demand growing
- Approved power plants are slow if impossible to come on line
- Transmission is expensive, politically difficult, loss of efficiency
- CL&P–recent upgrades in last 2 years
- 50% of CT electricity is consumed in SW Connecticut

EID Legislative Process

- Authorized as part of PA07-242 [CGS Section 16-32g(9)-(24)] in June 2007
- Adopted in Stamford as Local Ordinance October 24, 2007
- Board appointed, district mapped, Operational July 9, 2008

Purpose of the EID

- Encourage new, green energy systems to meet individual business or real estate facility needs
- Property owners form board, enter Power Purchase Agreements (PPA) that finance new micro-grids
- Decentralized power generation at site allows for use of existing grid as a back-up, reducing vulnerability to grid disruptions
- Reduced demand on grid
- Allows for new tech, assist in meeting LEED/green goals
- Not a ‘muni’

Government Center Project Overview

- Government Center is a 250,000 s.f. commercial bldg.
- Fuel cell-CHP system to make building independent of grid
- Contract with Pareto Energy, Washington, D.C.
- Demonstration of actual system, operational analysis, cost projections, interconnection to grid
- Concept is to expand to adjoining property as initial phase succeeds
- Additional areas of EID to utilize next generation system

Government Center Technology

Estimated cost break down (costs in $ thousands):	
Engineering:	
Site Work / Construction Materials / Finish	$69
Mech / Elec / Plumbing	$1,223
Interconnection / Switchgear / Microgrid	$670
Sound Proofing	$60
Fuel Cell	$1,903
Engine and Emissions Controls	$661
Heat Recovery	$95
Absorption Chiller	$130
Project Support / General Requirements	$68
Construction Documents / As-Builts	$338
Permitting	$85
Design–Bid–Award / General Conditions	$209
Insurance	$80
Design-Build Fee	$254
Project Development Fee	$383
Financing and Construction Loan Fee	$506
Contingency	$266
Total Upfront Cost	**$7,000**

Incentives:	
Clean Energy Fund Feasibility Grant	($50)
CT Clean Energy Fund On-Site Renewables	($847)
Efficiency & Conservation Block Grants	($223)
Bldg Energy Efficiency Tax Deduction	($166)
Federal Investment Tax Credit	($1,449)
Pending:	
EPA Climate Showcase Communities Grant	($500)
Total Incentives	($3,235)
Net Project Cost	**$3,765**

Government Center Technology

Power will be provided by a single fuel cell and a single natural-gas reciprocating engine, supplemented by grid power, existing back-up power, and room for expansion with additional fuel cells and/or engines. The leading suppliers under consideration are:

Name:	UTC PowerPureCel l 400	GE Jenbacher JMS 316
Capacity:	400kW + 0.785MMBtu/hr	672kW + 2.5MMBtu/hr
Technology:	Phosphoric Acid	Natural Gas with Heat-Recovery (HRSG)

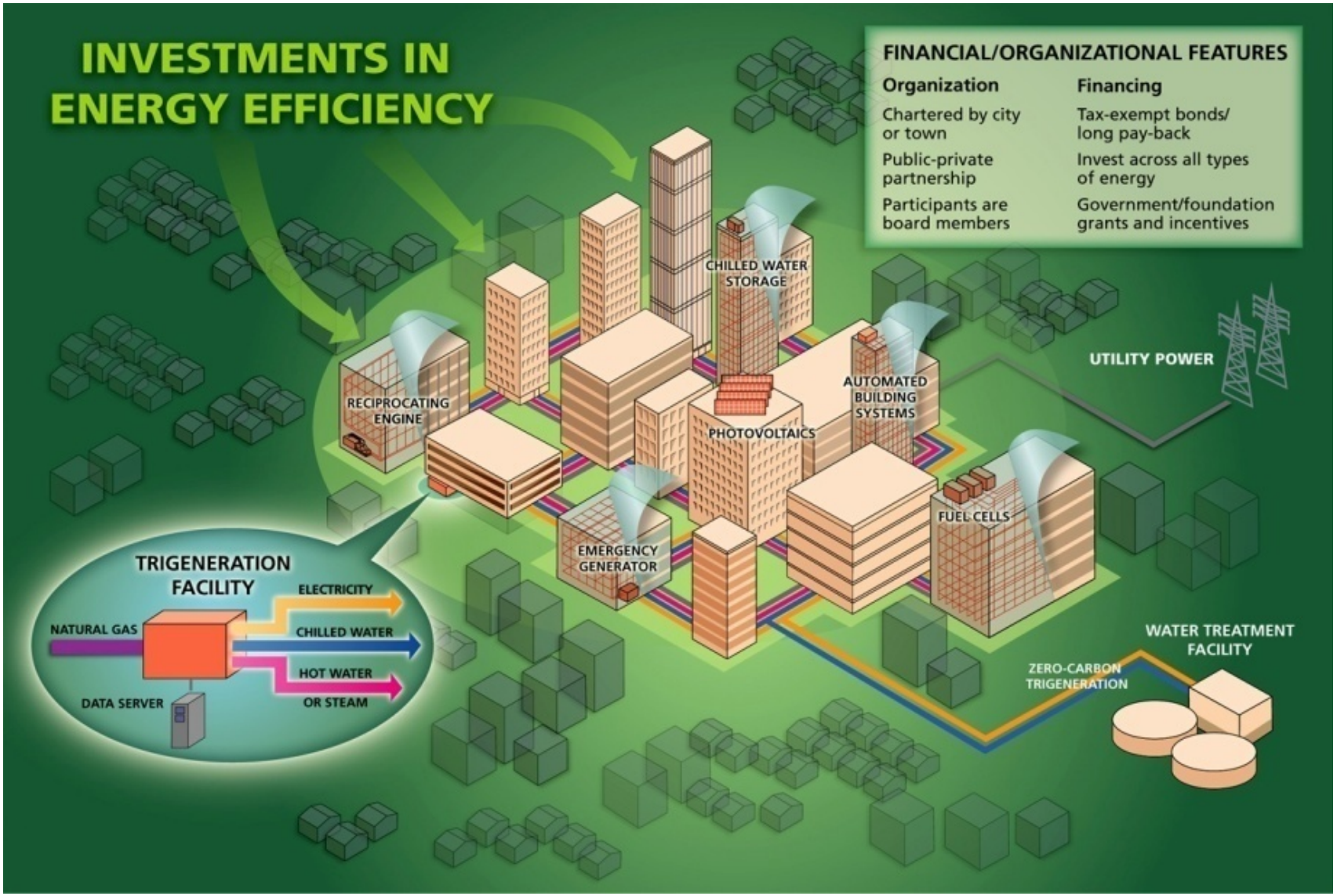
Installation Schedule:

City signs Energy Services Agreement	10 - 2009
Complete Project Development / Finance Plan	12 - 2009
Begin Design-Build process	01 - 2009
Begin site construction	04 - 2010
Install fuel cells	08 - 2010
Commence full operations	09 - 2010

Government Center Goals

- Demonstration for EID using microgrids as an economic development tool
- More reliable power for critical city functions such as emergency response center
- Lower costs due to higher efficiency of CHP system
- Reduce city carbon footprint (Sustainable Stamford goal)

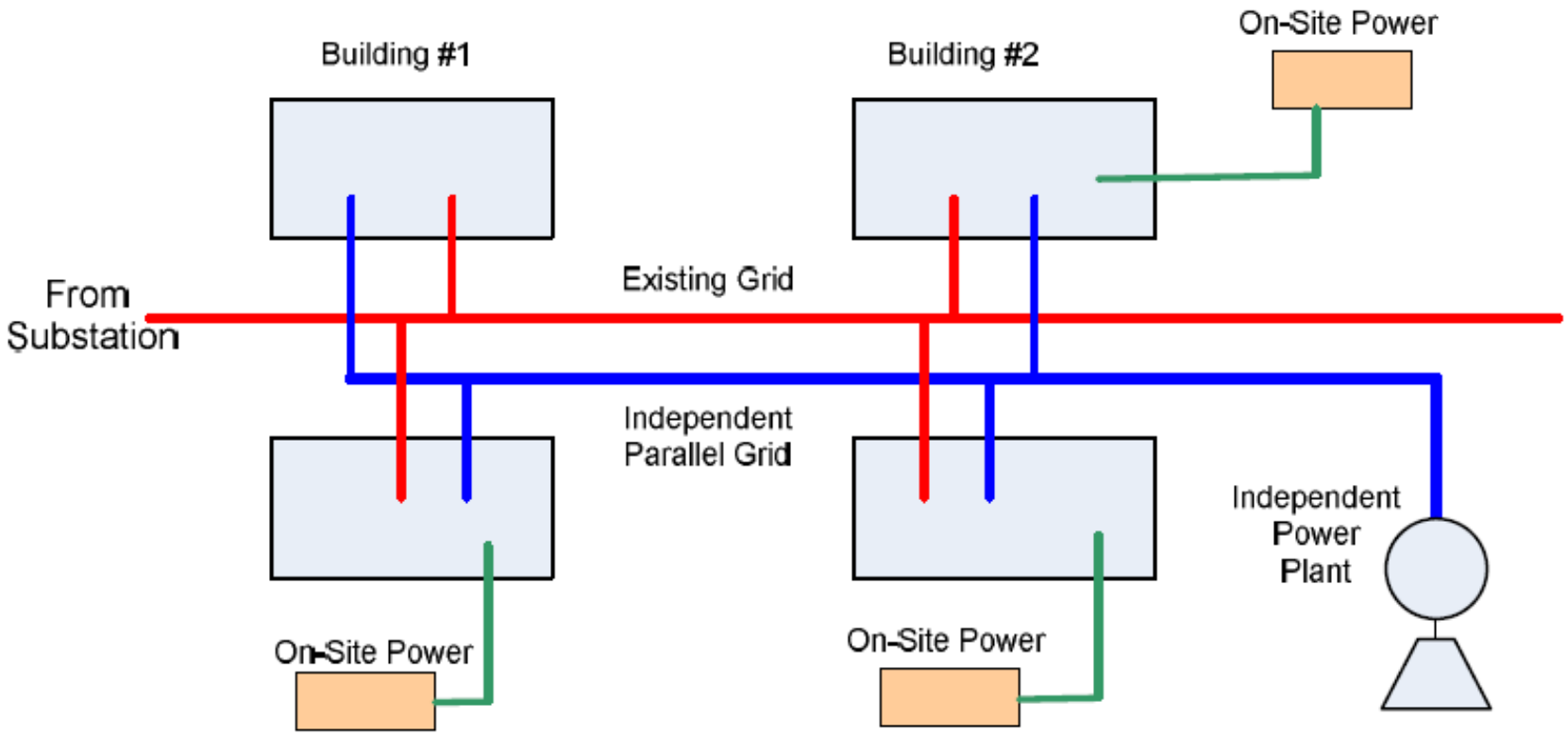
The Government Center Project Provides a Regulatory Model by Which More CHP and Other Distributed Energy Technologies In Stamford Can be Built and Safely Interconnected to the Grid and Governed by the Energy Users Through the EID



Interconnection Rules Limited Stamford EID Microgrid Development

- Enforced top-down power flow
- Strict “penetration limits” for CHP distributed generation (“CHP-DG”)
- CHP DG cannot contribute to grid voltage or frequency control
- Interconnection standards (UL1741, IEEE1547) only address safety (anti-islanding) and approval and testing processes

With GridLink ™, the EID microgrid can control itself independently or operate in conjunction with the utility's grid, connecting or disconnecting itself seamlessly as needed, without disrupting service



GridLink™ Overcomes the Need for Shutting Down the Microgrid During Grid Power Outages and Overcomes Costly and Sometime Futile Interconnection Applications

Induction	Synchronous	GridLink™ Non-Synchronous
Requires external power source to operate (Grid).	Self starting (does not need grid to operate); uses switches to isolate faults that could flow from the microgrid to the grid.	Multiple sources (from Grid and Microgrid) converted from AC to DC with fast power converters, and converted back to a single clean AC signal on a common microgrid bus
When the grid goes down, microgrid generation does not operate.	When grid goes down, microgrid generation must shut down, island itself, then come back up (fast switches can avoid shut down, but are usually not approved by utilities).	Microgrid can switch or change balance among power sources (including Grid) within microseconds, with no disruption to end users.
Interconnection is less complicated & less costly.	Interconnection requires costly and lengthy "system impact studies", expensive upgrades to utility systems and substations, can often be denied based on safety concerns.	Minimal interconnection procedure required; the GridLink™ power converters appear to the grid as a load management device.
Preferred by utilities.	Preferred by conventional project developers with some Federally-funded smart grid researchers trying to overcome the need for the microgrid to shut down when the grid goes down	Preferred by energy users.

Contact Information

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