PIDC: A Public-Private Partnership

Our mission is to spur investments, support business growth, and foster developments to create jobs, revitalize neighborhoods, and drive growth to every corner of Philadelphia.

To achieve our mission we attract, manage, and invest public and private resources in the clients, communities, and markets that energize Philadelphia’s economy.

We offer flexible financing tools, a targeted portfolio of industrial and commercial real estate and decades of Philadelphia based knowledge to help our clients, invest, develop and grow.

Over the past 56 years, PIDC has settled over 6,300 transactions – including $11.8 billion of financing and 3,000 acres of land sales – which have leveraged over $22 billion in total investment and assisted in retaining and creating hundreds of thousands of jobs in Philadelphia.
The Navy Yard Today

- More than 11,500 employees
- 145 companies; 3 Navy activities
- In excess of 7.0 million SF occupied
- $750+ million of private investment
- $150+ million of publicly-funded infrastructure improvements
- Office, R&D, and industrial campus
Smart & Sustainable Infrastructure
A Smart Energy Campus

- Unregulated Electric Microgrid
- Collaborative R&D and Deployment:
  - Headquarters of Penn State’s CBEI
  - Smart Grid Technologies
  - Progressive Tariff Structures
  - Creative Financing Opportunities
  - Distributed Generation Campus
- Energy Master Plan focus on EE in The Navy Yard’s portfolio of buildings
- Opportunities for entrepreneurship, technology commercialization and product deployment
- Business Development Tool
A Center for R&D

CORPORATE

CLINIGEN
WuXi AppTec
CLCE LIFE CYCLE ENGINEERING
ndi
Airgas
GENERAL DYNAMICS
ITT
G
c
McKean
G
c
GROUP
Northrop Grumman

ACADEMIC & GOVERNMENT

PENN STATE
Drexel UNIVERSITY

PARTNERSHIPS

ERC Manufacturing Accelerator
Ben Franklin Technology Partners

Driving growth to every corner of Philadelphia
The Navy Yard Energy Master Plan and Grid Modernization

- Navy Yard Energy Master Plan - 2013
- Grid Modernization Plan (2014 – 2016)
  - approximate $33 million
  - public and private investments
  - smart meters, communications, NOC controller
- On-site Generation
  - 6 MW natural gas peak shaver/back up power
  - 1 MW on-site solar generation
  - 10 MW substation with PECO tie-ins
The Navy Yard Energy Master Plan

The Five Point Action Plan

• **Infrastructure**: Capacity, Generation/Supply, Technology – Microgrid strategies

• **Business Model**: Forecasts, Tariffs, Procurement, O & M, Capital

• **Building Owner Opportunities**: DG, EE, DR – Programs & Partnership

• **Test Bedding Outreach and Protocols**: Energy Innovation Campus

• **Carbon Reduction and Sustainability**: Reduce Carbon Intensity
The Navy Yard 6 MW Peak Shaver Business Proposition

• Cost effective solution for one of our capacity challenges
• Economics of avoided “business as usual” construction and “avoided external supply costs” justify investment
• Additional value from PJM ancillary market makes the difference
• Additional business marketing advantage: - external power loss resilience
• Brings private sector to the table
• Economics: 3-year payback compared to “business as usual” scenario
• Schedule:
  • pre-construction, underway
  • final PPA: Nov 2015
  • in service: Oct 2016

Driving growth to every corner of Philadelphia
The Navy Yard Solar

- 750 kW generation consisting of two arrays:
  a) GSK canopy parking and
  b) PAID industrial building roof
- business model: community solar
- unique alternative energy option benefiting business development value proposition
- again, brings private sector to the table
- economics: TNYEU commits to $0.12/kwh w/ 1.5% fixed annual inflator thus hedging against energy market fluctuations
- schedule:
  - due diligence, underway
  - final PPA: Nov 2015
  - in service: Apr 2016
The Navy Yard Energy Storage

- existing frequency regulation 250 kW battery in service since 2013
- two new batteries being considered with backing of Sun Edison
- creating integration strategy that:
  - integrates with NY microgrid controller
  - matches one of batteries with demand-fluctuating NY customer
- demonstrates business model for commercialized energy storage
- other projects such as community solar to include storage components
- schedule for two new facilities:
  - due diligence, underway
  - final PPA: Nov 2015
  - in service – 2nd Q, 2016
Energy Master Plan #3 – Leveraging the Individual Business Participation

- **Understand and Educate Each Navy Yard Business**: understand and communicate the significant revenue and cost avoidance opportunity

- **Design EE Incentives with Alternative Customer Tariff to Incent Good Practices**: offer choice that results in profit to our customers (key customers first)

- **Include Infrastructure (e.g.: design of NOC) to Support Good Practices**: Be sure to include the necessary “bells and whistles” to show off customer revenues and savings

- **Achievable results – vastly leveraged capacity**: Each business privately justifies additional energy efficiency, generation, and storage capacities that the microgrid operator can inventory for broader deployment

- **Achievable results – the happy Navy Yard customer**: increased profitability, sustainability and energy choice – something they cannot get elsewhere
MicroGrid Controller and NOC

- integrating on-site generation and storage with external supply
- new 4-year contract with Constellation Energy that includes block and index procurement strategies that utilize on-site resources
- DOE MicroGrid controller funding and participation
- providing electric customer participation and economic benefits
- results: significant energy efficiency (EE) and demand response participation by the end-user customer
- schedule:
  - project underway, 50% complete
  - in service: 1st Q, 2016
Alstom Vision - ALSTOM Microgrid Center of Excellence at The Navy Yard

- ISO MARKET
- DISTRIBUTION UTILITY

U.S. DEPARTMENT OF ENERGY

Microgrid Controller Initiative

The Navy Yard (TNY) Microgrid (Approx. 15% Solar-Storage)

ALSTOM

- Micro Grid Control Room Technology Platform
- Smart Digital Substation Platform
- Microgrid Systems Design
- Grid Modernization Architect

PIDC

- Program Management of TNY Grid Modernization

PENN STATE

Invention of GridSTAR EC A Micro Grid Test Bed

Research & Development of Smart Grids & Power System Technology

Work Force Training

PECO

An Exelon Company

1201 Normandy Place

MicroGrid Center of Excellence ALSTOM

The Burns Group
Types of Microgrid by Size

Megagrid:
- Microgrid at transmission level serving 100s of MVA (above 120-kV)
  - Ex: Large windfarm with storage

Minigrid or Milligrid:
- Microgrid at primary or medium voltage distribution level serving 10 to 100 MVA (15 to 35 kV)
  - Ex: Large Distribution substation

Microgrid:
- Microgrid at primary voltage level serving 1 to 10 MVA
  - Ex: Small Distribution substation

Nanogrid:
- Microgrid at primary and/or secondary (low) voltage level serving 100 kVA to 1 MVA
  - Ex: Distribution transformer serving a group of commercial and/or industrial customers

Picogrid:
- Microgrid at secondary or low voltage level: 100 KVA or less
  - Ex: Distribution transformer serving a small group of residential customers

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Driving growth to every corner of Philadelphia
Demonstrating value via the MicroGrid business model

- PIDC preparing an O&M microgrid solicitation with two phased response:
  - Expression of Interest – Oct ‘15
  - RFP (incorporating types of interest and ideas from E of I) – Jan ‘16

- to include balanced approach to microgrid profitability and economic development objectives
- providing **flexibility based on goals of each microgrid community objectives**
- microgrid owner functions as local unregulated PUC
- **creating economic value for the local microgrid** and **more control in local communities**