



SCI Laurel Highlands

Landfill Gas Cogeneration Plant

Somerset, PA

Pennsylvania Public Utilities Commission

En Banc Hearing

Combined Heat and Power Technology

October 7, 2014

PENNSTATE



Facilities Engineering Institute

Project Overview

- SCILH treats landfill leachate @ WWTP
- Landfill provides methane gas (LFG) to SCILH
- SCILH burns LFG in gas turbine w/heat recovery
- Steam & electricity meets SCILH needs + grid sales
- Backup - natural gas and grid electricity
- Specialized supporting & backup equipment is required
- Implemented as a GESA project

Original Conditions – circa 2005

647,000 SF facility
with 888 residents

3- 550 HP Riley
Bituminous coal
stoker steam boilers

Peak steam load
20,000 lb./hr. @
120 psig

1,188 kW peak
electric demand
with a 0.75 load
factor

On-site laundry
facility provided a
summer thermal
load

Coal-fired plant
becoming a concern
with future pending
legislation

Opportunity

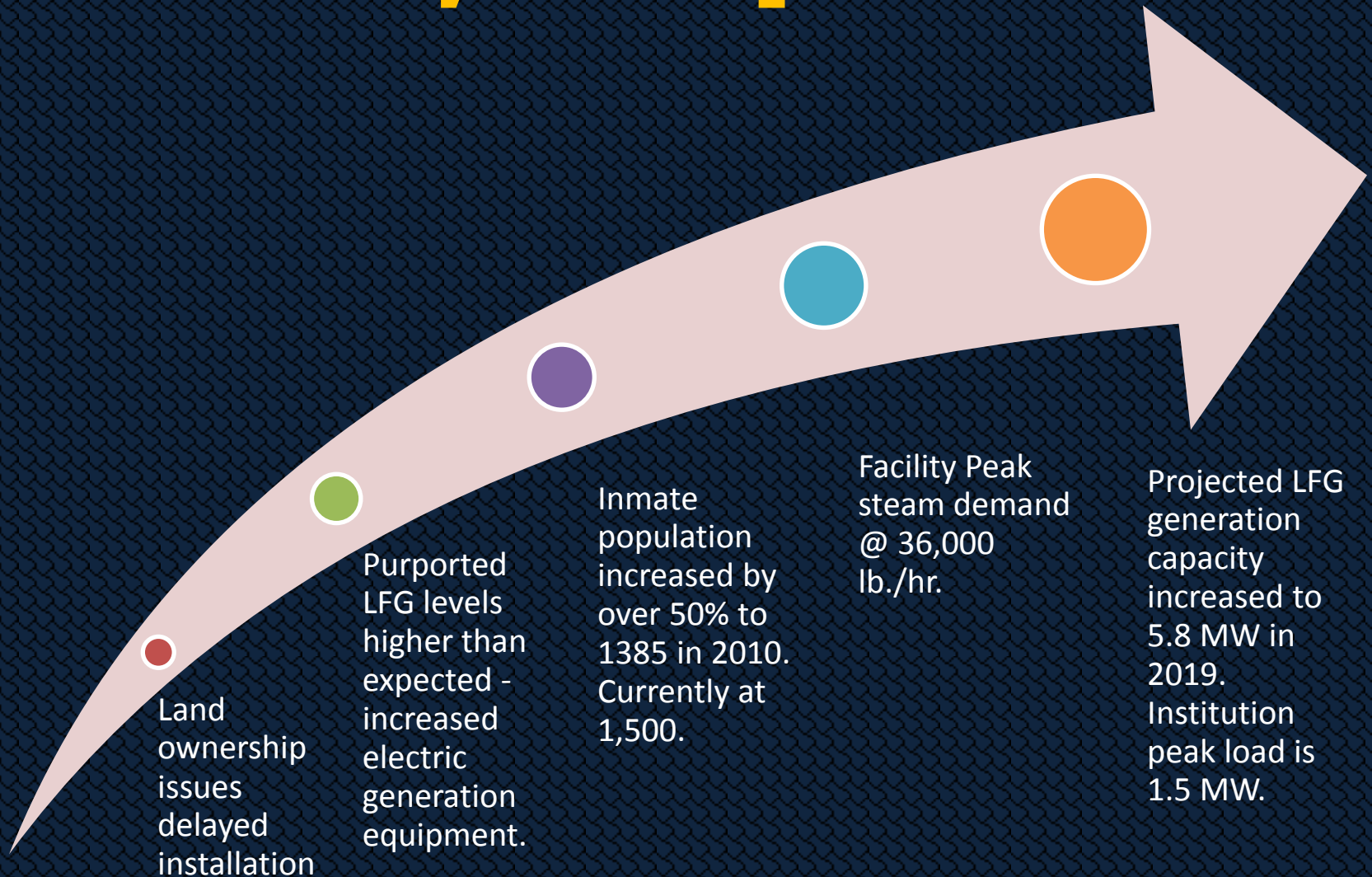
Nearby landfill needed leachate treatment capability

Landfill gas provided a renewable energy source.

GESA program enabled project without capital funding.

19 ECMs
\$33 million
LFG CHP
\$25.5 million

Delays & Expansion



Implementation



Cogeneration plant installed during 2011 with initial startup in August 2012.



Landfill installed 4+ mile pipeline and DOC expanded sewage treatment plant to handle leachate.



Natural gas line was installed as a back-up fuel source for steam boilers



Equipment

Primary - 7.46 MW and 53,700 lb./hr. capacity

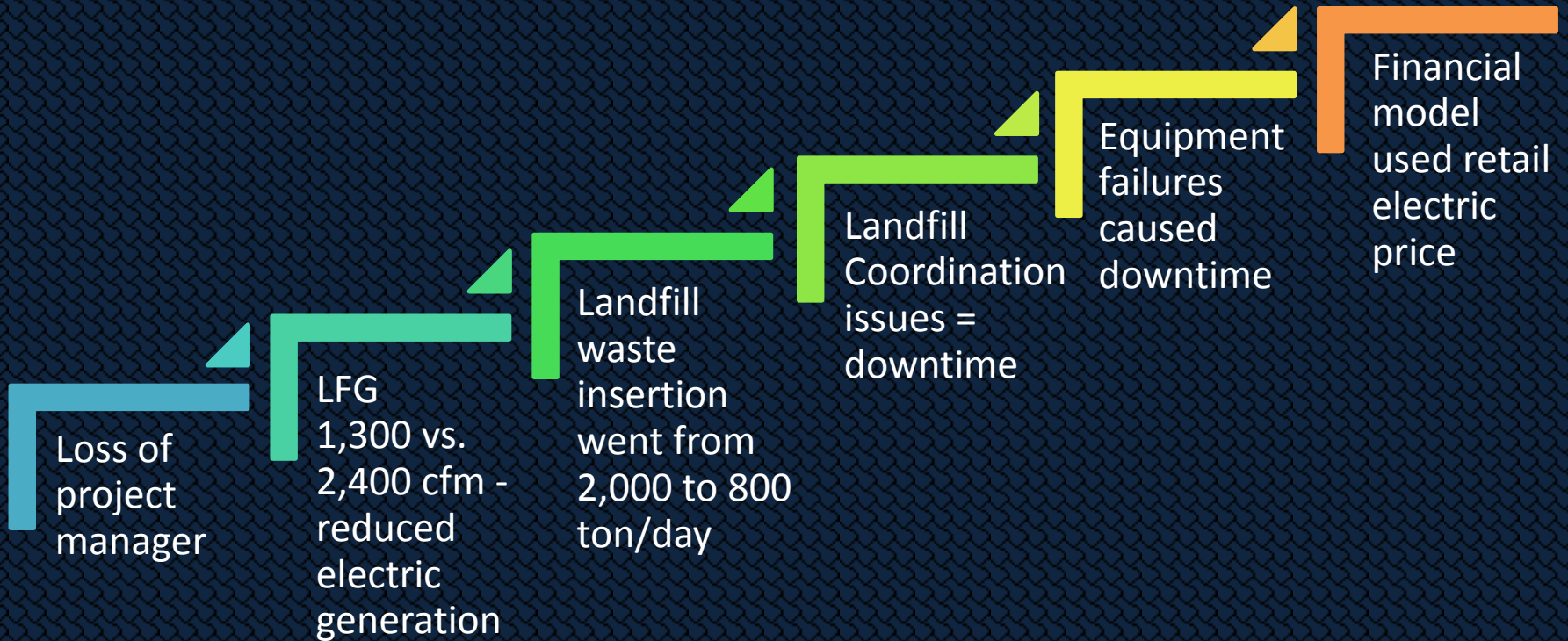
(Facility load: 1.5 MW and 36,000 lb/hr)

- 1 - 3.76 MW Solar LFG turbine with
- 1 - Indeck 19,200 lb./hr. heat recovery boiler
- 1 - 500 kW Elliott condensing steam turbine
- 2 - 1.6 MW LFG Cat generators
- 1 – Johnston 500 HP (17,250 lb./hr.) LFG/NG boiler
- 2 - Muira 8,625 lb./hr. NG steam boilers

Supporting Equipment

- 3 - low-pressure compressors
- 2 - duplex scrubbers
- 1 - high pressure compressor (for Solar Turbine)

Issues



Project completion & commissioning issues
resulted in withholding final payment

Items Requiring Resolution

Defined maintenance and service responsibilities related to annual service contract

Failed equipment repair responsibilities

Landfill gas generation potential discrepancies

More equipment installed than needed

Significant negative cash flow

Lessons Learned

Complex and “hidden” costs associated with selling and buying back-up electricity and natural gas

- Effort, complexity, & cost of buying utilities during planned plant maintenance and unplanned downtime
- Complexity and effort of selling generation (skillset required, risk, timeliness)
- Organizational distraction from core business

Real Lifecycle Cost

- Limited technical support for turbine
- Cannot self-perform most maintenance
- What happens at the end of 10 to 15 years???

Risk

- Business case impact of fluctuations in utility pricing over duration of project
- Unplanned equipment downtime

Contract Issues

- Landfill gas agreement
- Inability to control landfill waste volume and LFG availability and reliability
- Maintenance contracts and cost

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