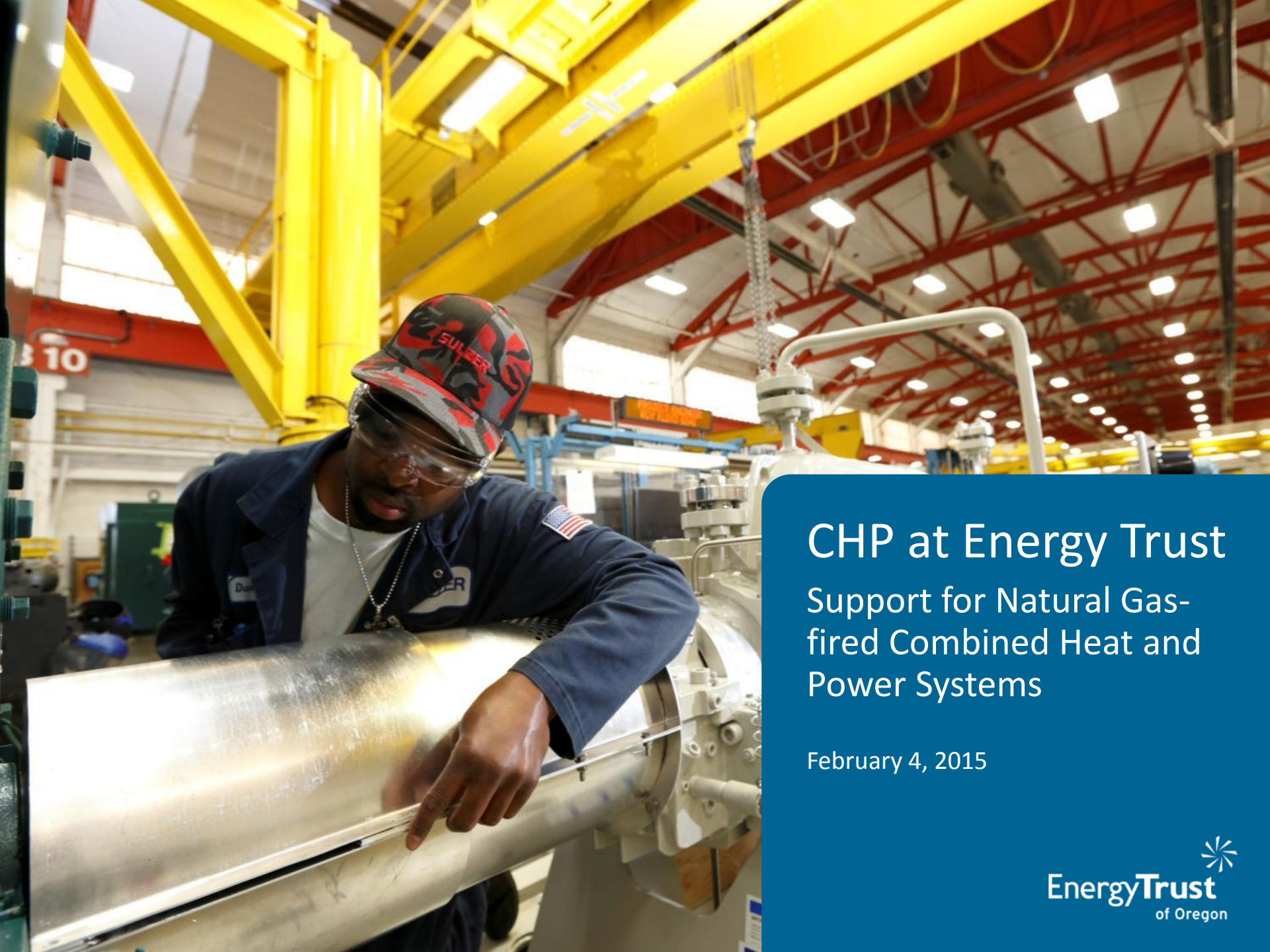


CHP at Energy Trust

Support for Natural Gas-fired Combined Heat and Power Systems

February 4, 2015

Energy Trust of Oregon

Gas CHP = conservation

- Biomass and Biogas CHP are Renewables
- 2005 OR Dept. of Justice memo says gas-fired CHP is electric conservation if it:
  - Is used on-site to offset otherwise purchased electricity.
    - Power sold to utility is not considered conservation.
  - Meets efficiency and cost-effectiveness criteria

Eligibility Criteria

- Minimum Efficiency:
  - CHP system must be lower than 6,120 net heat rate (10% better than new CCGT)
    - Net heat rate include credit for efficiency of boiler being offset
- Cost Effectiveness:
  - Must pass utility and societal cost-effectiveness tests just like all other conservation measures

Eligibility Criteria

- Selling Power Offsite:
  - Energy Trust only provides incentives for portion of total electric generation used on-site
- Serving Utility:
  - Must be PGE or PAC customer in Oregon
- Fuel Source:
  - Primary fuel source for CHP must be Natural Gas

Incentives

- CHP is Custom, administered through Custom track of efficiency programs: Production Efficiency, Existing Buildings, Multifamily

- Incentive $.08/kwh (2007-2014), capped at 50% of eligible project costs.
  - Incentives >$500,000 may be approved by the board for significantly better than average cost to Oregon ratepayers

- Self-direct entities are eligible if consistent with Energy Trust self-direct policy

Custom CHP Project Analysis

- Determine site eligibility and project sorting
- Conduct preliminary scoping meeting and/or site visit to verify correct sorting (efficiency or renewables) and obtain project information
- Perform a CHP technical Assessment
  - Customer provided or ATAC developed
- Analyze results of commissioning report
- Incentive paid once project is verified

Energy Savings Calculation

- Based on net performance increase compared to a modern central power plant
  - Baseline is the average net heat rate (6,800 btu/kWh) of the next marginal resource, assumed to be a CCGT

CHP Savings Methodology

Step #1: Determine "Fuel Chargeable to Power"

- Measures incremental heat rate of net power compared to a heat-only system

- Allows for direct comparison to power-only system

$$FCP = \frac{Gas\ Input\ (Btu) - \dfrac{Heat\ Recovered\ (Btu)}{Offsetting\ Boiler\ Efficiency}}{Net\ Electricity\ Generated\ (kWh)}$$

Step #2: Calculate Annual Savings Compared to Grid

$$Savings_{kWh} = \left(1 - \frac{FCP}{6800}\right) \times kWh_{CHP}\ *$$

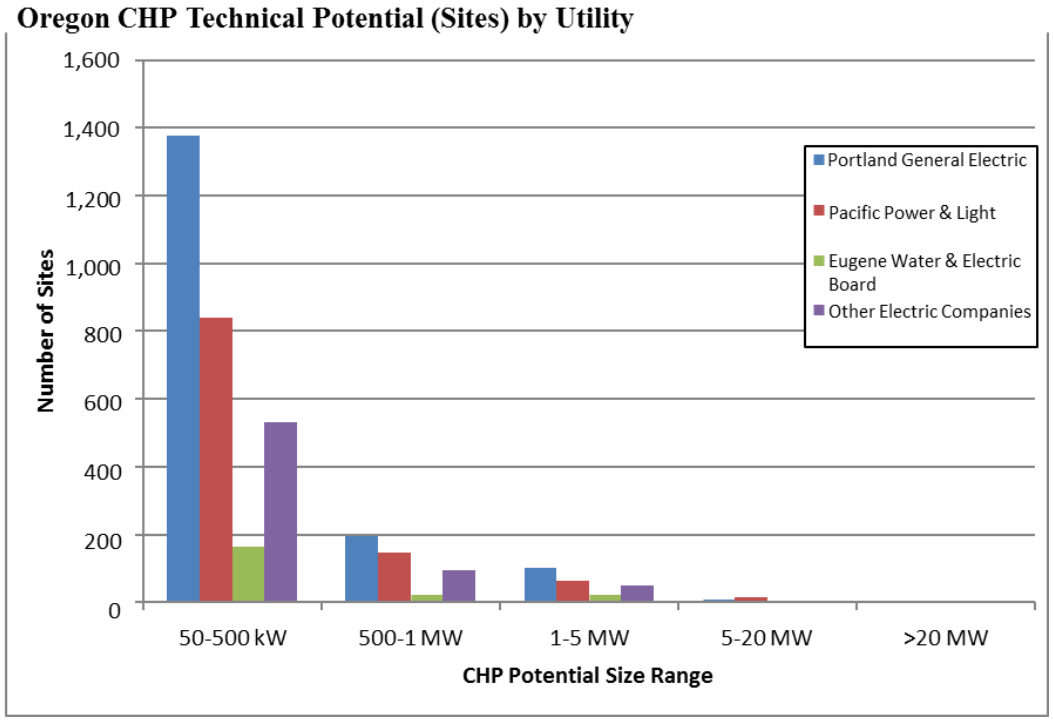
*Determining kWh_{CHP} and heat recovered requires an in-depth technical analysis

Project info needed for incentive determination

- Heat Rate of generator (BTU/kWh)
- Recovered Usable Heat (BTU/kWh)
- Efficiency of Boiler (%)
- Generation capacity (kW)
- Operating hours
- Transmission service level
- Capital cost of project (less any deferred capital)
- Added O&M and fuel cost per year
- Operating life

Why Increase Incentives?

- To date, Energy Trust has provided incentives for 2 projects
- 2014 ICF assessment study indicates large technical potential for CHP in Oregon, particularly in the Industrial sector
- Achievable potential focused in PGE and PAC territories



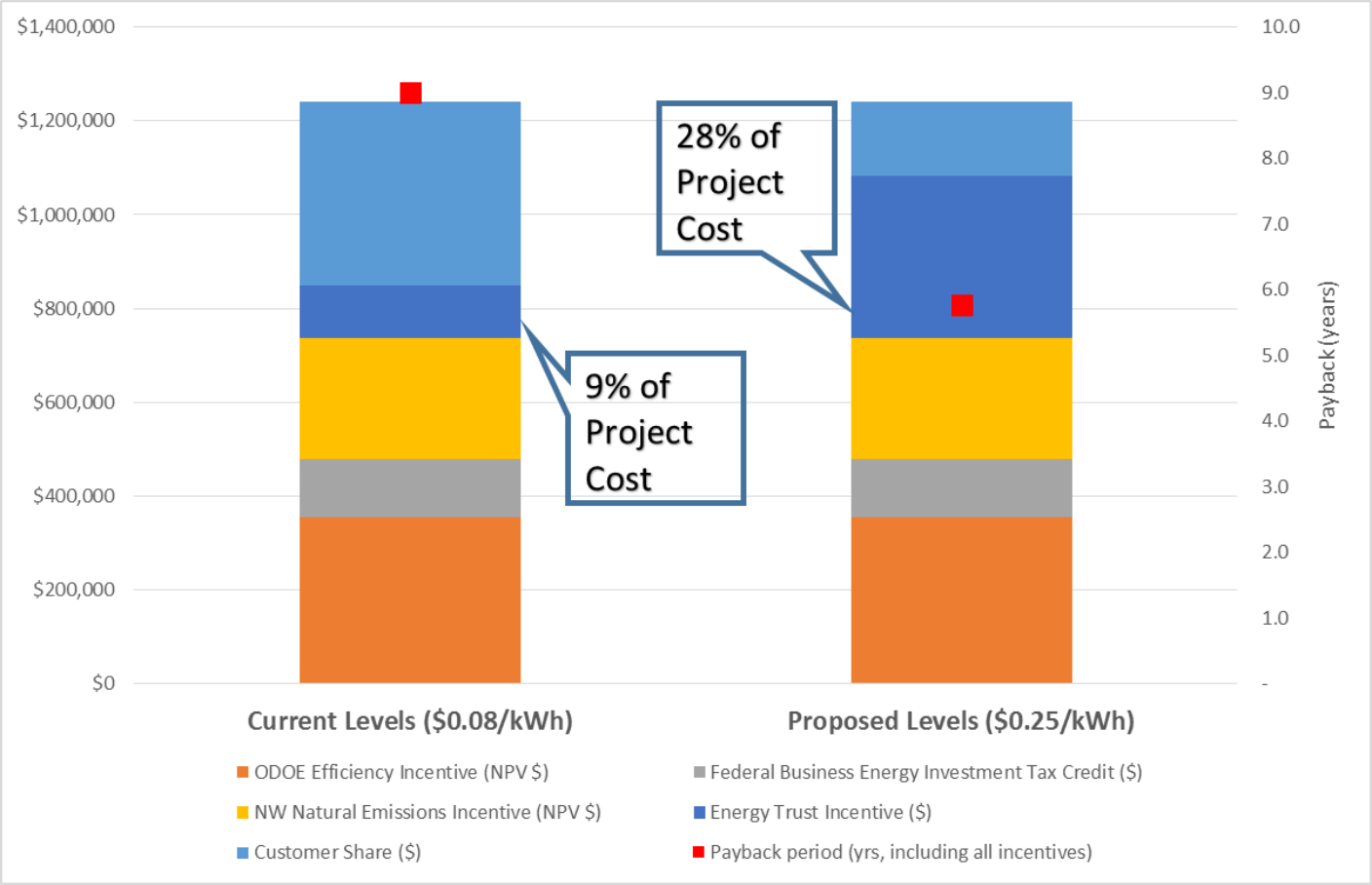
http://www.oregon.gov/energy/CONS/Industry/docs/Oregon_CHP_assessment_report.pdf

Why Increase Incentives?

- High capital costs of CHP systems are a primary barrier
- Current $0.08/kWh incentive does not provide meaningful reduction of capital cost
- Making CHP incentive the same as other Custom electric EE (currently $0.25/kWh) will offset capital costs by a much larger percentage
- Increasing incentives leverages other funding sources to create viable CHP projects in Oregon:
  - Oregon Department of Energy Tax Credit
  - NW Natural Emissions Reduction Credit (SB-844)
  - Federal Business Energy Investment Tax Credit

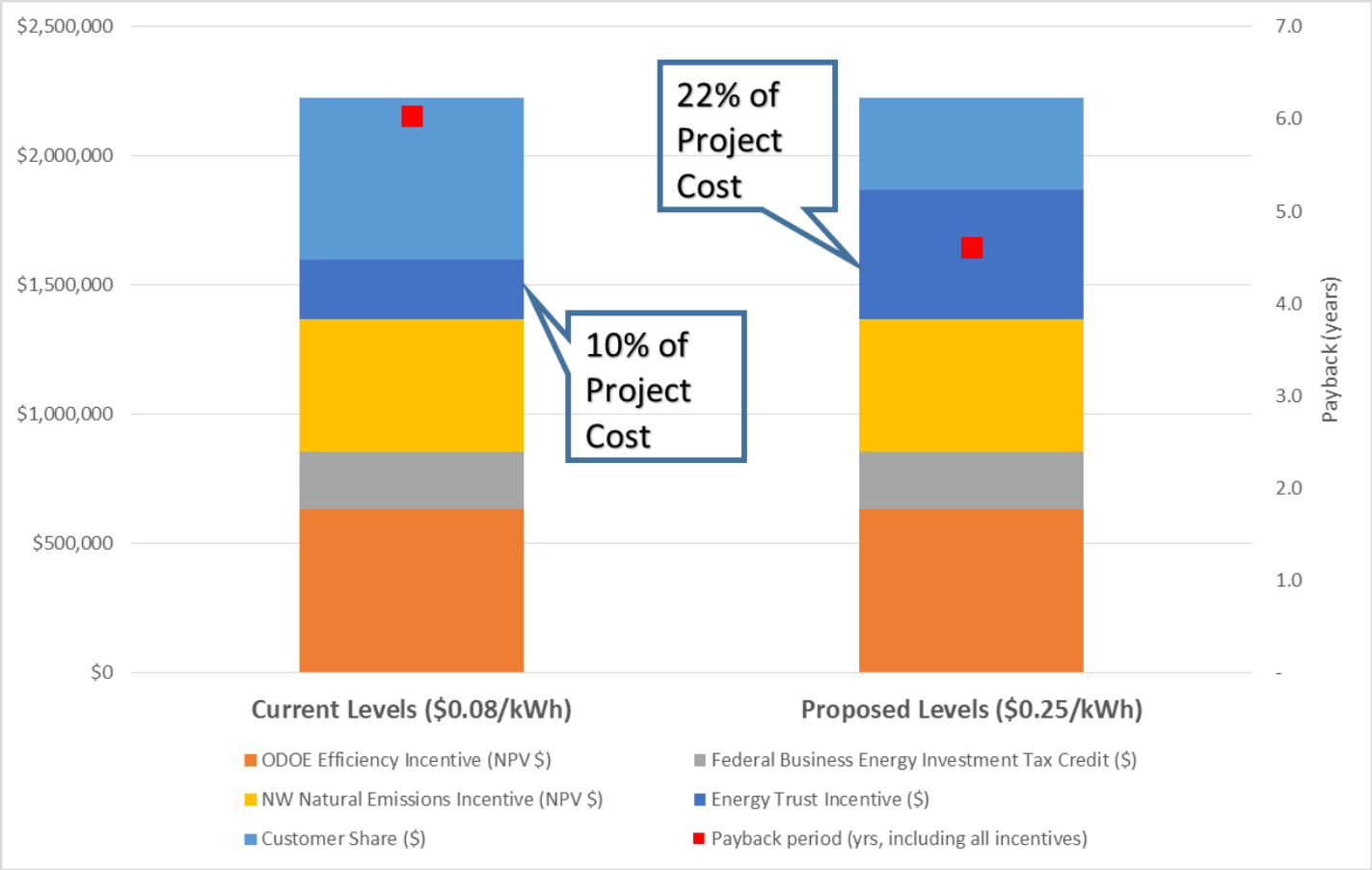
Example: 500 kW CHP

- Customer share drops from 32% to 13%



Example – 1,000 kW CHP

- Customer share drops from 28% to 16%



Thank You

Kim Crossman,
Industry & Ag Sector Lead
kim.crossman@energytrust.org
(503) 459-4074

EnergyTrust of Oregon