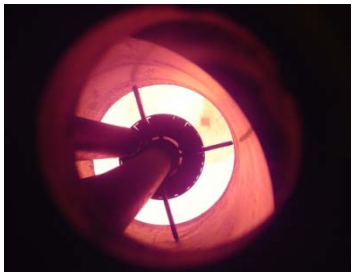
Advanced Biomass Gasification For Heat and Power Application

Jonathan Rhone, President & CEO, Nexterra Systems Corp.
November 9, 2010



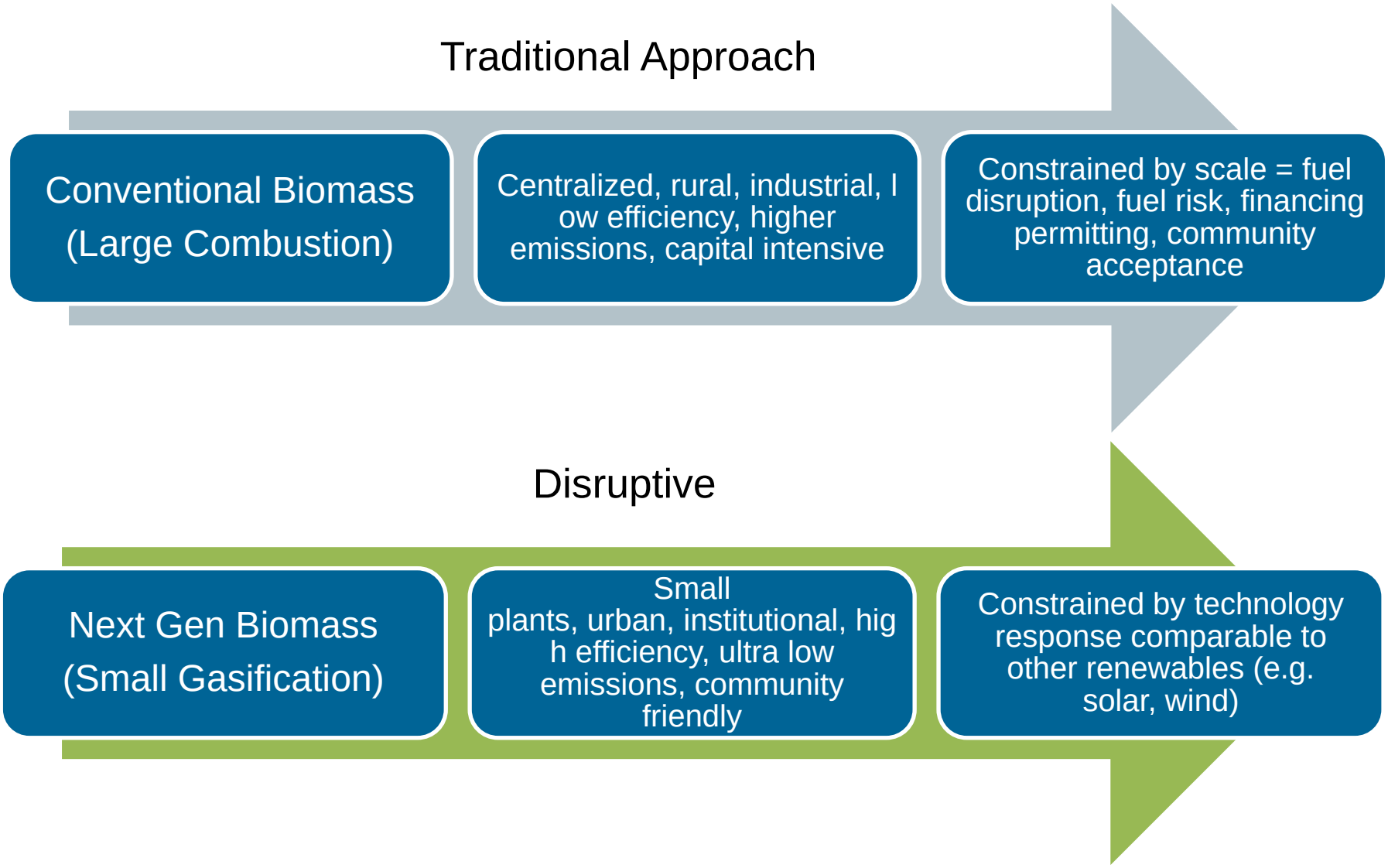


UBC SUSTAINABILITY

British Columbia Clean Energy Goals

- 90% of power already from renewables
- 100% of new power from renewables
- Legislated GHG reductions of 33% by 2020
- Carbon tax of $20/tonne - $30/tonne by 2012
- Carbon neutral government
- $1 Billion cleantech demos
- UBC Living Lab for “smart energy” demos

Reinventing Biomass

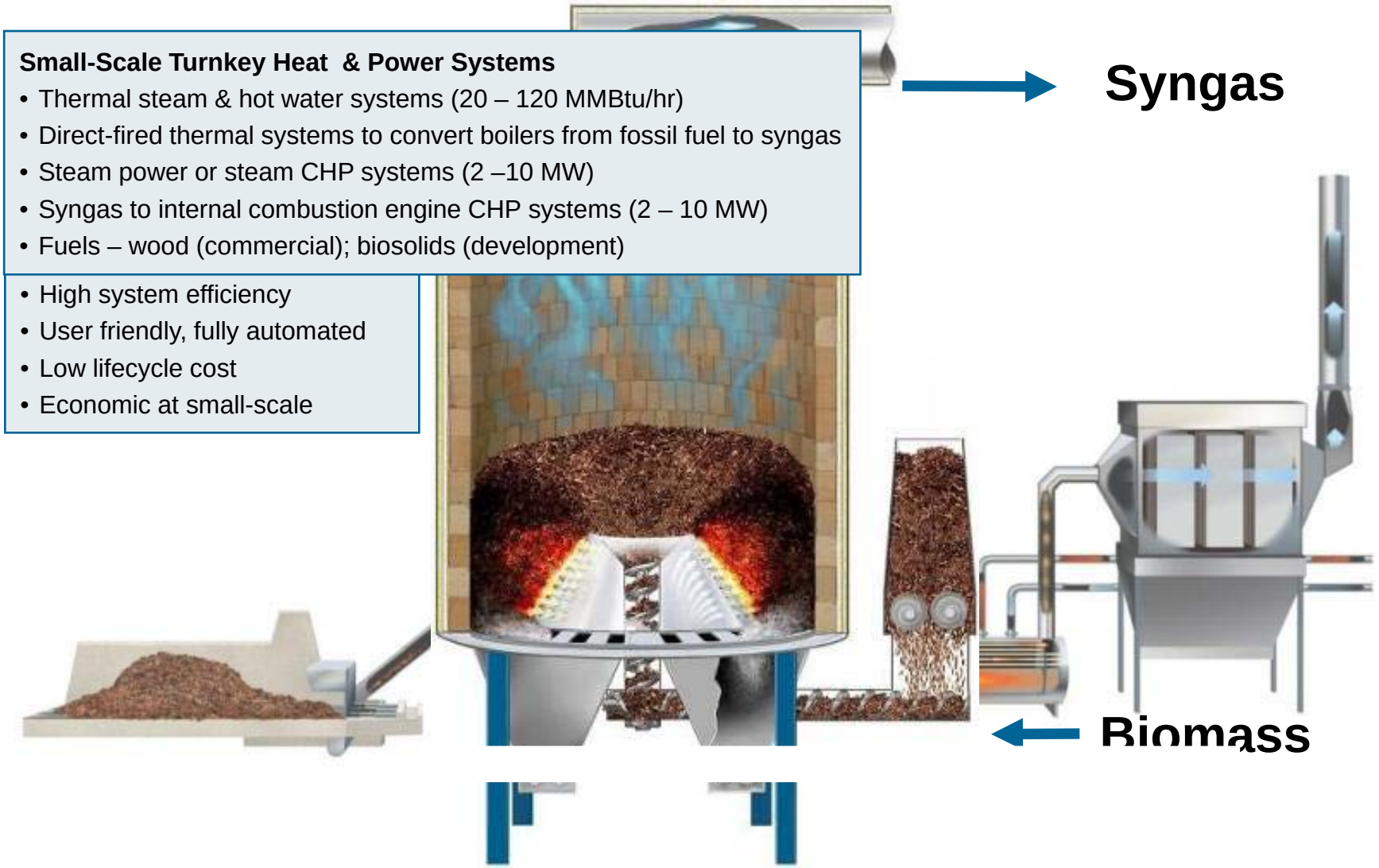


System Packages for On-Site Heat and Power

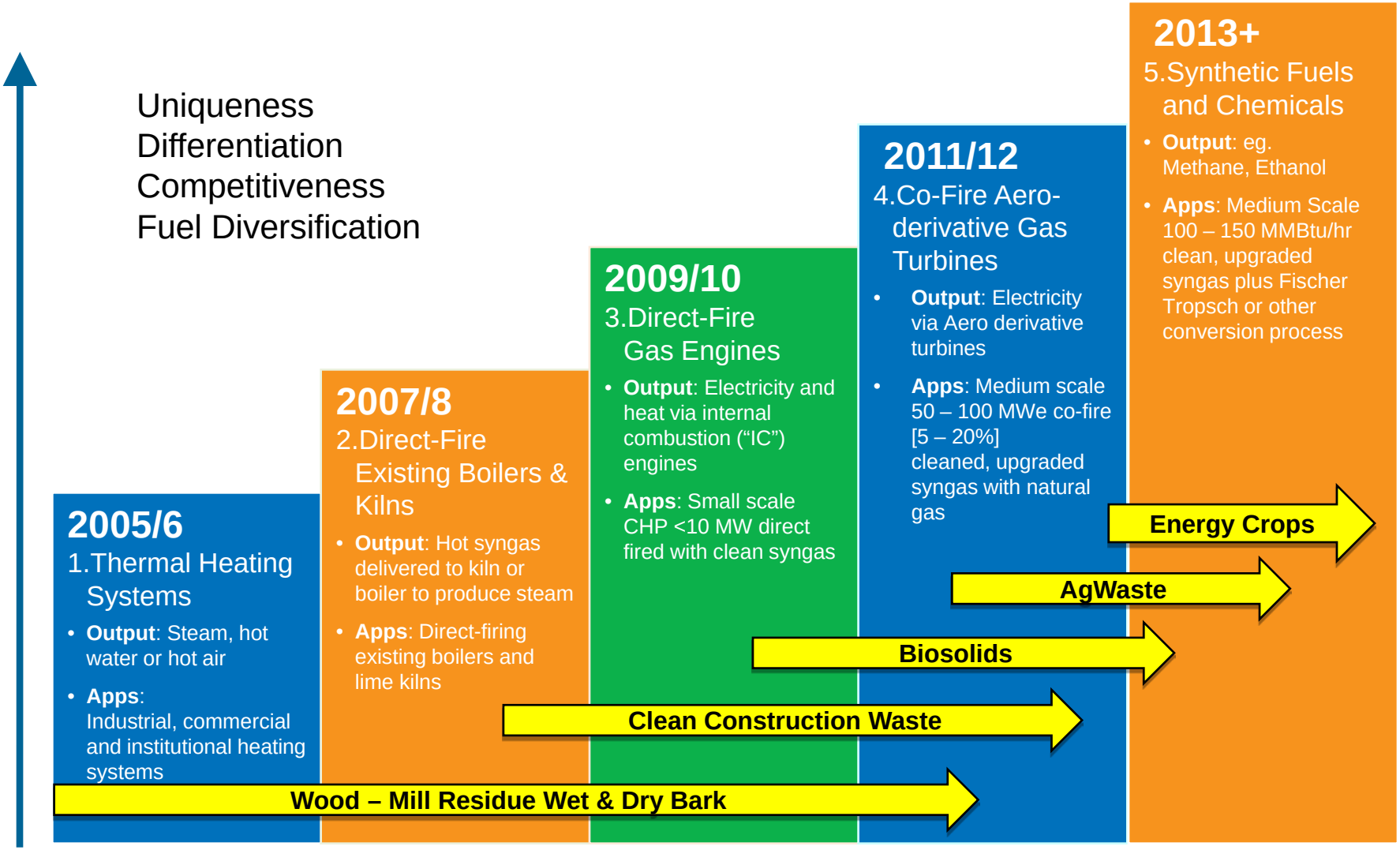
Small-Scale Turnkey Heat & Power Systems

- Thermal steam & hot water systems (20 – 120 MMBtu/hr)
- Direct-fired thermal systems to convert boilers from fossil fuel to syngas
- Steam power or steam CHP systems (2 –10 MW)
- Syngas to internal combustion engine CHP systems (2 – 10 MW)
- Fuels – wood (commercial); biosolids (development)

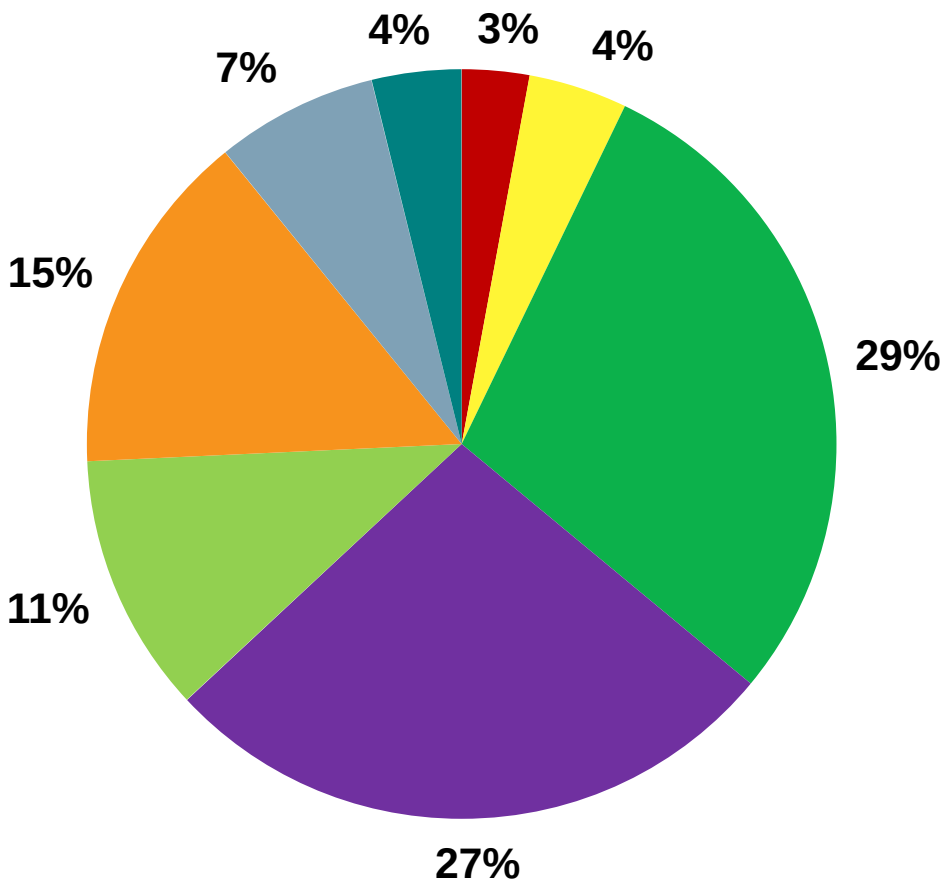
- High system efficiency
- User friendly, fully automated
- Low lifecycle cost
- Economic at small-scale



Nexterra Application Roadmap



Our Customers – Vertical Markets



DOCKSIDE GREEN

Dockside Green – Victoria BC

- District Heating & Hot Water – 8 MMBtu/hr
- Fueled with Urban Wood Waste
- LEED platinum development
- Recognized by Clinton Climate Initiative
- Started up May 2009

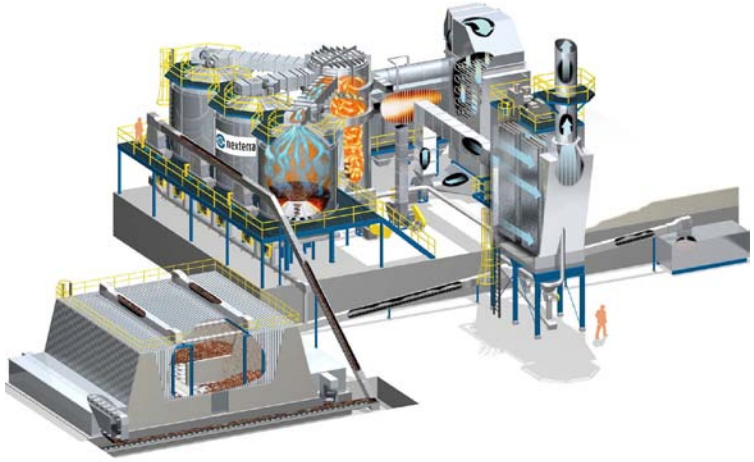
U.S. DEPARTMENT OF ENERGY

OAK RIDGE National Laboratory

Johnson Controls

Oak Ridge National Labs

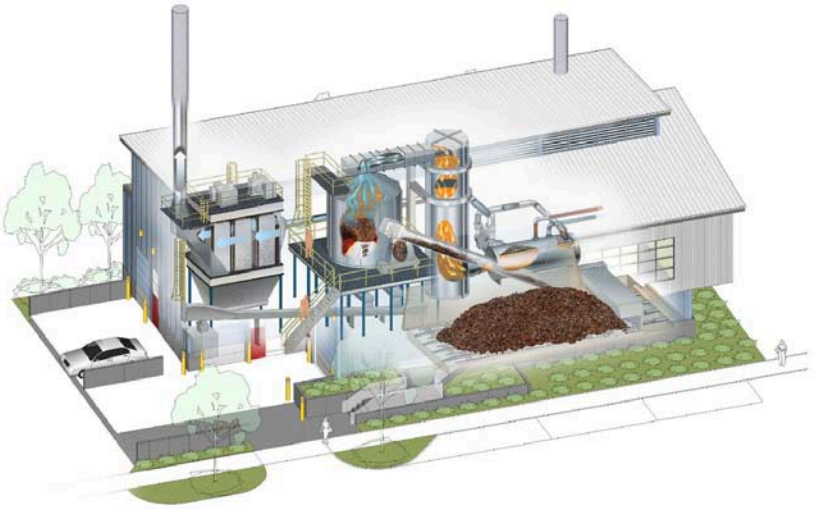
- 60,000 lbs/hr steam plant
- Annual Savings: $4.0 MM
- GHG Reduction: 22,000 tpy
- Operational Q2/2011



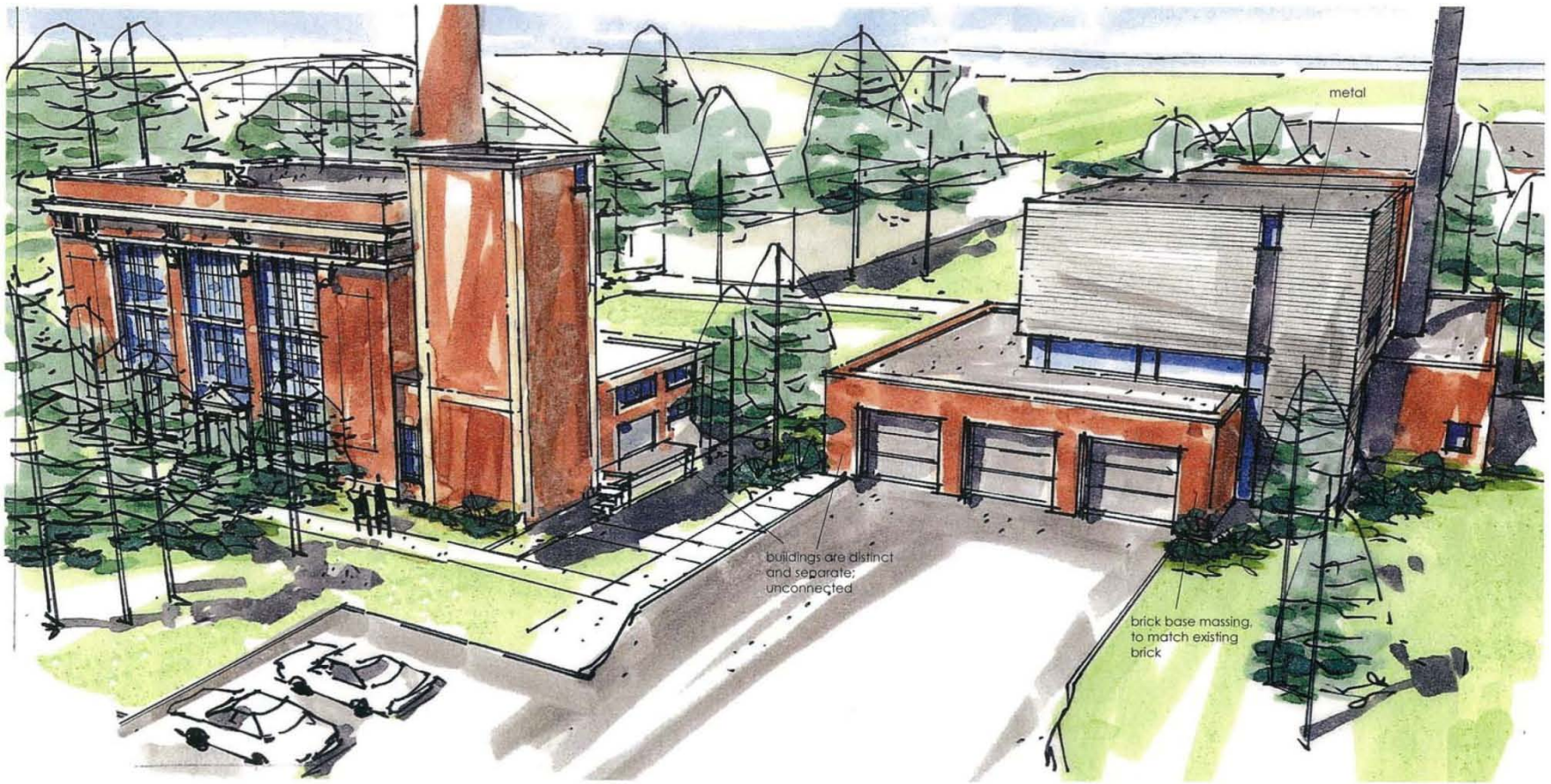
UNBC

UNBC – Prince George British Columbia

- 15 MMBtu/hr central heating plant
- Hub of UNBC's Bioenergy Innovation Center
- Phase 1 Thermal, Phase 2 GE CHP
- Built in living lab / teaching and learning center



University of Montana



modern / detached concept

University of Montana
missoula, MT

McKinstry
For The Life Of Your Building
CTA

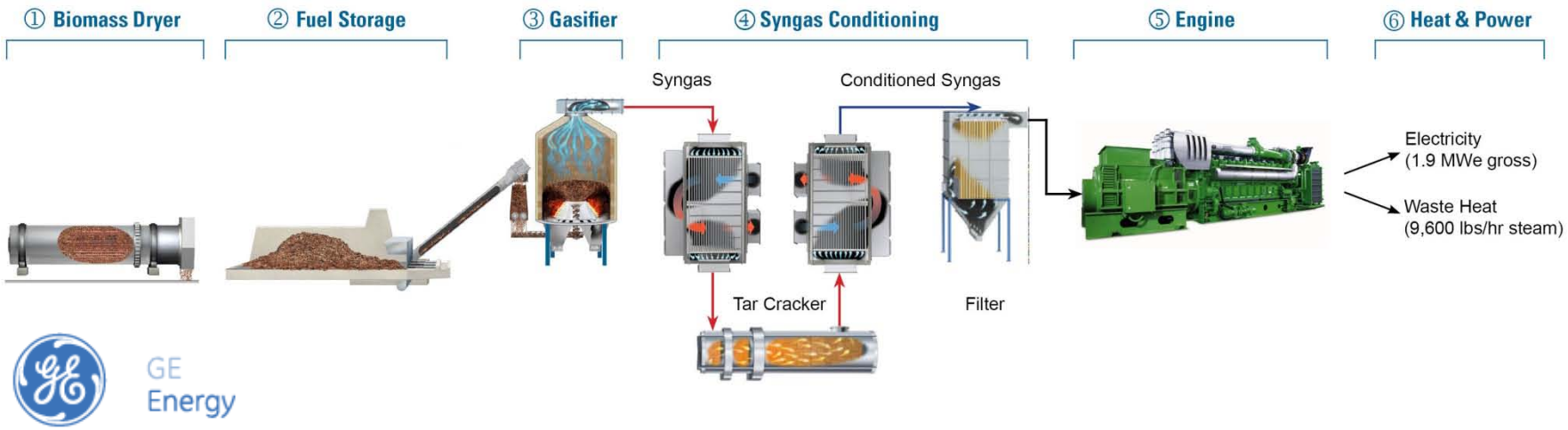
nexterra

Game Changing CHP System

- Nexterra's CHP System represents a step change over conventional biomass systems. Developed with GE Energy over the past 3 years
  - **Superior performance**: up to 60%+ efficiency in co-generation mode
  - **Small scale**: minimal fuel requirements not disruptive to local biomass markets
  - **Modular design**: short construction time, allowing rapid deployment
  - **Improved environmental profile**: natural gas equivalent particulate emissions

Will enable a paradigm shift in the biomass power market: Evolution from large centralized facilities to distributed networks of small-scale plants

GE/Nexterra – A New Standard of Biomass CHP System



- Small-scale, inside-the-fence heat and power 2 – 10 MWe
- Game changing, breakthrough technology for biomass to power
- Combines Nexterra's gasification technologies with IC gas engines
- Significantly more efficient than conventional steam power generation (65% in CHP)
- Firm, base load green energy vs intermittent power such as wind or solar
- No steam engineers and natural gas comparable emissions for PM

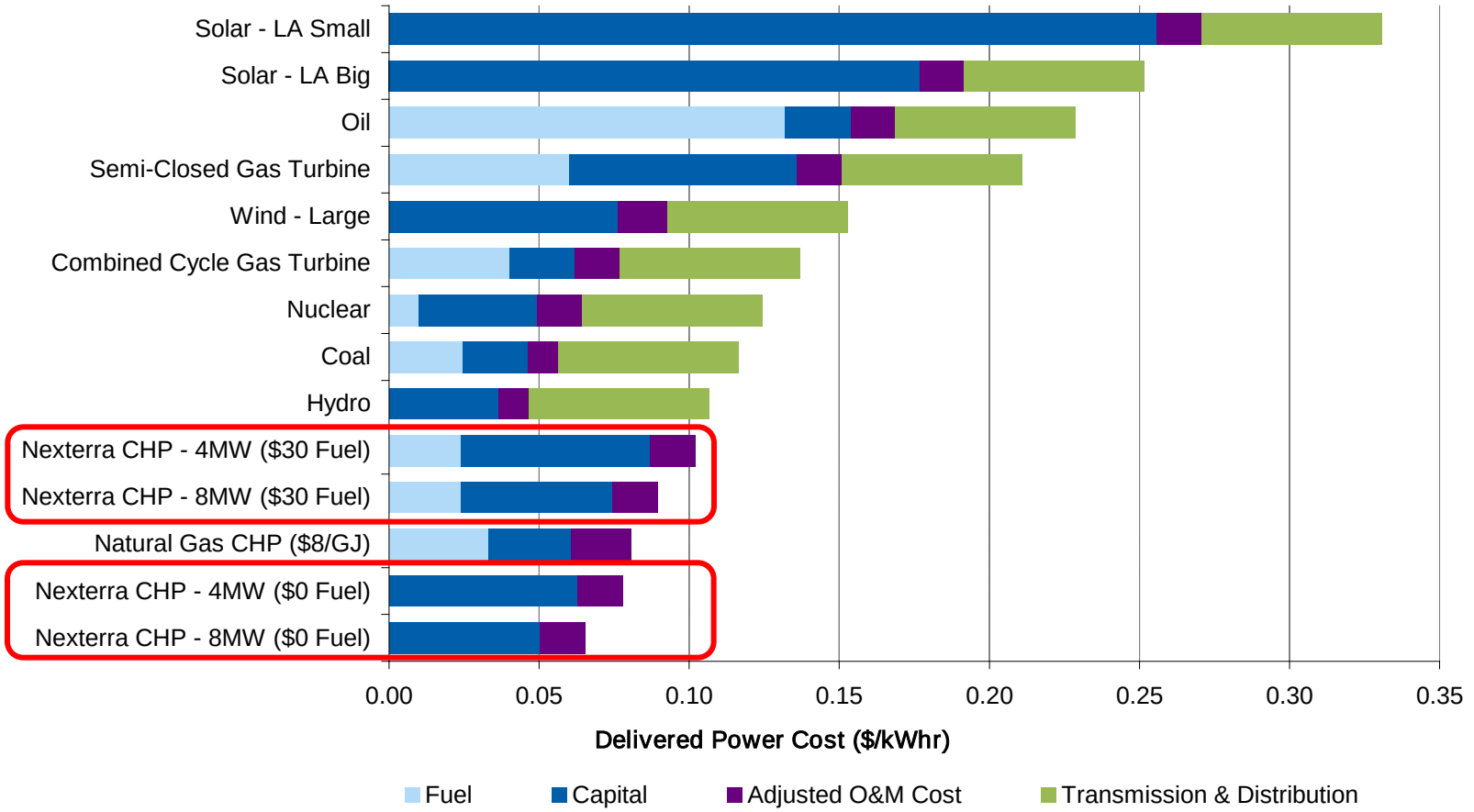

gas engines


UBC
SUSTAINABILITY

GE/Nexterra Biomass CHP - Levelized Cost-of-Energy

- Nexterra's CHP system is able to deliver one of the lowest levelized cost-of-energy solutions

Levelized Cost of Power Alternatives[1]



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Thank You!