FEDERAL UTILITY PARTNERSHIP WORKING GROUP SEMINAR

May 7 - 8, 2014

Virginia Beach, VA

Combined Heat and Power for Federal Facilities and the DOE CHP Technical Assistance Partnerships

Hosted by:

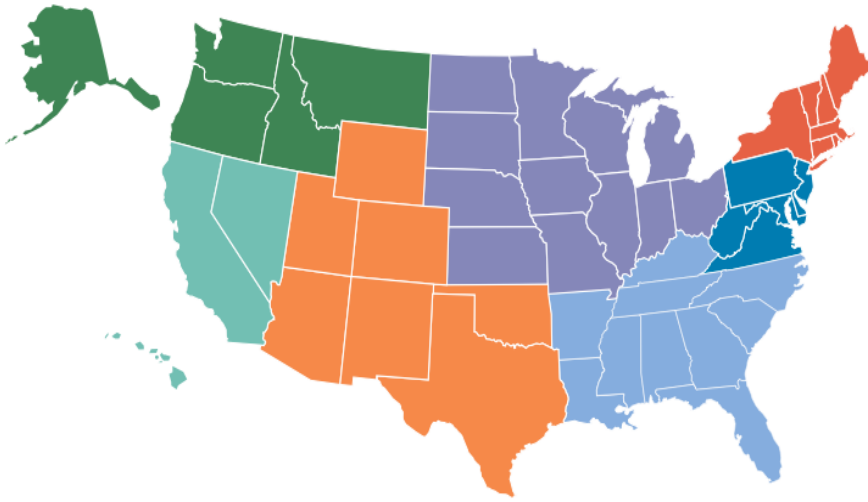
FEMP Federal Energy Management Program

Virginia Natural Gas®
An AGL Resources Company

U.S. Department of Energy
Clean Energy Application Centers

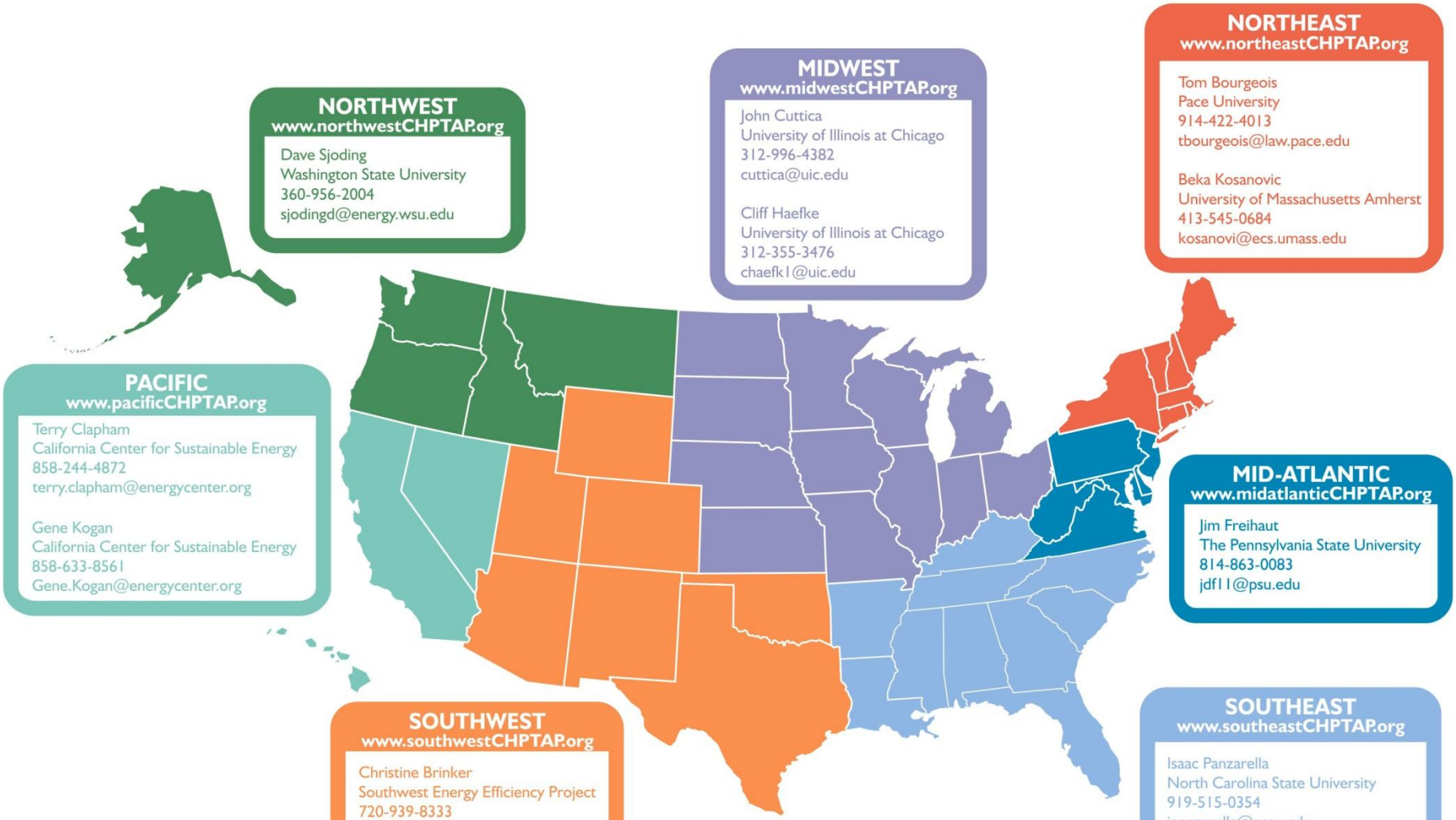
DOE CHP Technical Assistance Partnerships
Key Activities

- **Market Opportunity Analysis.**
  Supporting analyses of CHP market opportunities in diverse markets including industrial, federal, institutional, and commercial sectors
- **Education and Outreach.**
  Providing information on the energy and non-energy benefits and applications of CHP to state and local policy makers, regulators, end users, trade associations, and others.
- **Technical Assistance.**
  Providing technical assistance to end-users and stakeholders to help them consider CHP, waste heat to power, and/or district energy with CHP in their facility and to help them through the development process from initial CHP screening to installation.



http://eere.energy.gov/manufacturing/distributedenergy/chptaps.html

DOE CHP Technical Assistance Partnerships (CHP TAPs)



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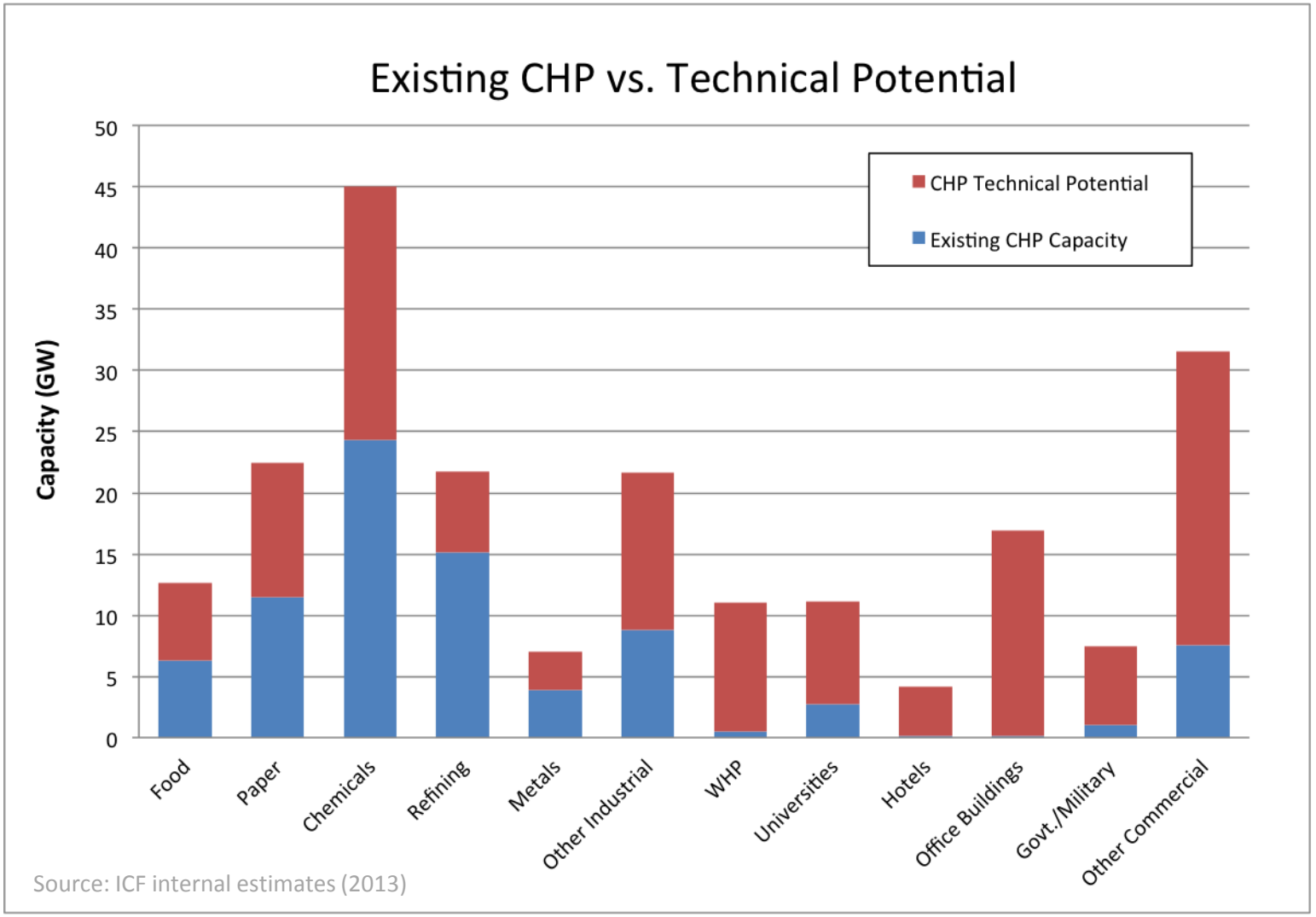
President's Executive Order 13624: 40GW of new CHP by 2020

Achieving this goal would:

- Increase total CHP capacity in the U.S. by **50 percent** in less than a decade
- Save energy users **$10 billion a year** compared to current energy use
- Save **one quadrillion Btus** (Quad) of energy — the equivalent of 1 percent of all energy use in the U.S.
- Reduce emissions by **150 million metric tons of CO2 annually** — equivalent to the emissions from over 25 million cars
- Result in **$40-$80 billion in new capital investment in manufacturing** and other U.S. facilities over the next decade

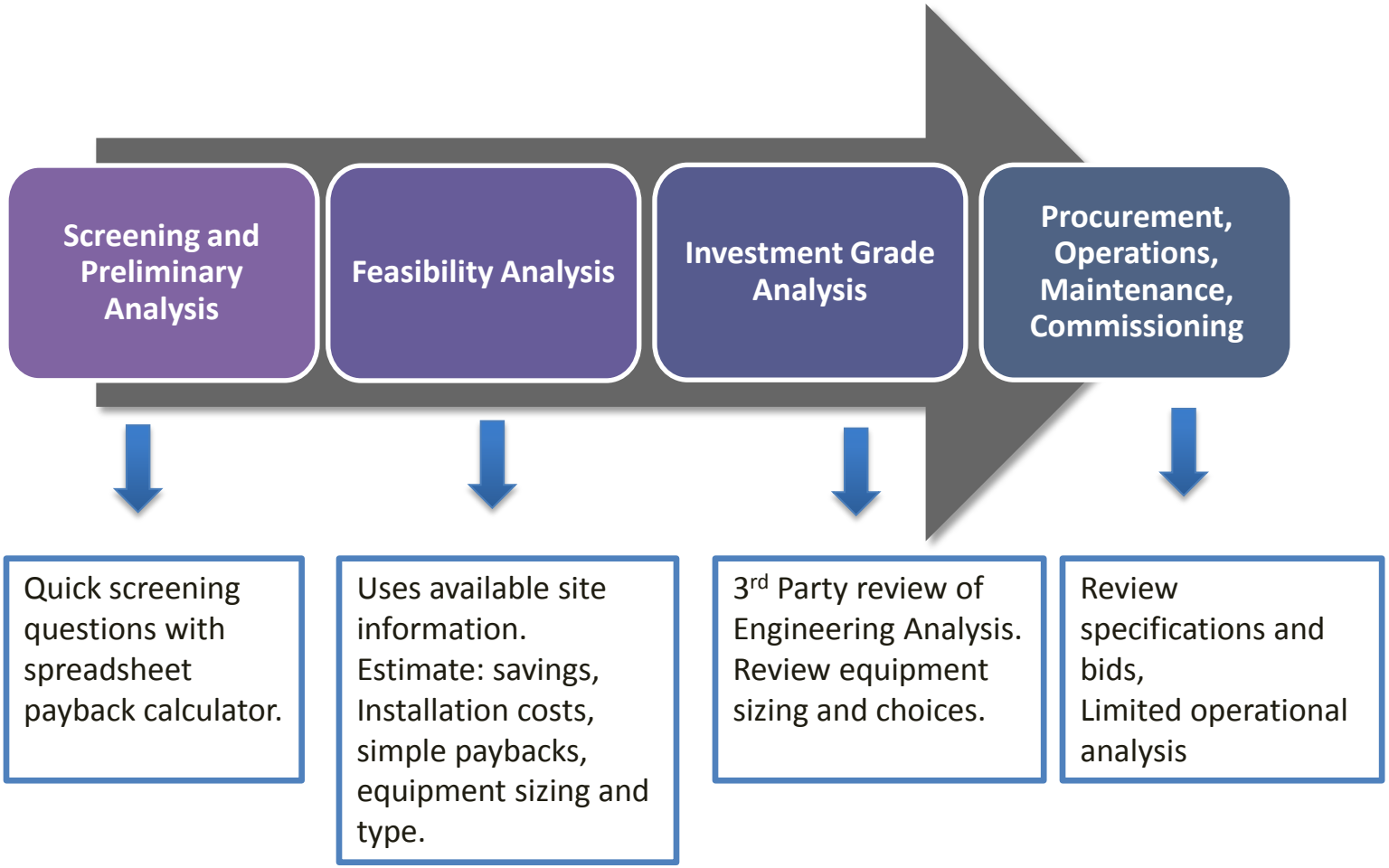
Source: DOE/EPA, CHP: A Clean Energy Solution, August, 2012, www1.eere.energy.gov/manufacturing/distributedenergy/pdfs/chp_clean_energy_solution.pdf

Where's the Remaining Potential for CHP?



Source: ICF internal estimates (2013)

CHP TAP Technical Development Assistance



Benefits of CHP for Federal Facilities

- CHP is *more efficient* than separate generation of electricity and heat
- Higher efficiency translates to *lower operating cost*
- Higher efficiency *reduces emissions of all pollutants*
- CHP can also *increase energy reliability and enhance power quality*
- On-site electric generation, when properly designed, *ensures mission critical operations*

CHP and Critical Infrastructure

"Critical infrastructure" refers to those assets, systems, and networks that, if incapacitated, would have a substantial negative impact on national security, national economic security, or national public health and safety."

Critical Infrastructure CHP Applications:

- Military/National Security
- Hospitals and healthcare centers
- Water / wastewater treatment plants
- Police, fire, and public safety
- Centers of refuge (often schools or universities)
- Food distribution facilities
- Telecom and data centers

CHP and Critical Infrastructure Resiliency

- A key principle of disaster preparedness
- Ability to maintain operation despite a devastating event
- CHP (if properly configured):
  - Offers the opportunity to improve critical infrastructure resiliency
  - Can continue to operate, providing uninterrupted supply of electricity and heating/cooling to the host facility

CHP Applications in Federal Facilities

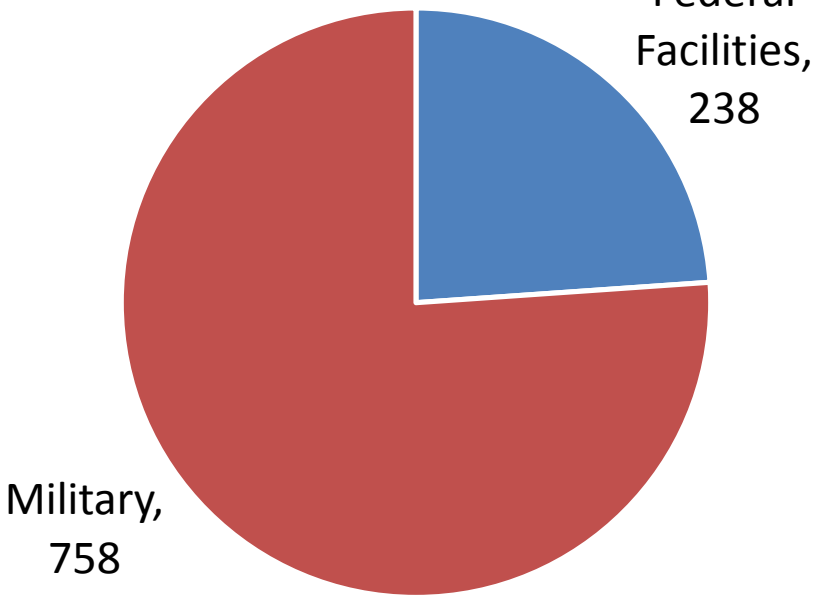
Agencies with CHP applications include:

- Department of Agriculture (USDA)
- Department of Defense (Air Force, Army, Coast Guard, Marines, Navy)
- Department of Energy (DOE)
- Department of Health and Human Services (HHS)
- Department of Housing and Urban Development (HUD)
- Department of Justice (DOJ), including the Bureau of Prisons (BOP)
- Department of Veterans Affairs (VA)
- General Services Administration (GSA)
- National Aeronautics and Space Administration (NASA)
- US Postal Service (USPS)

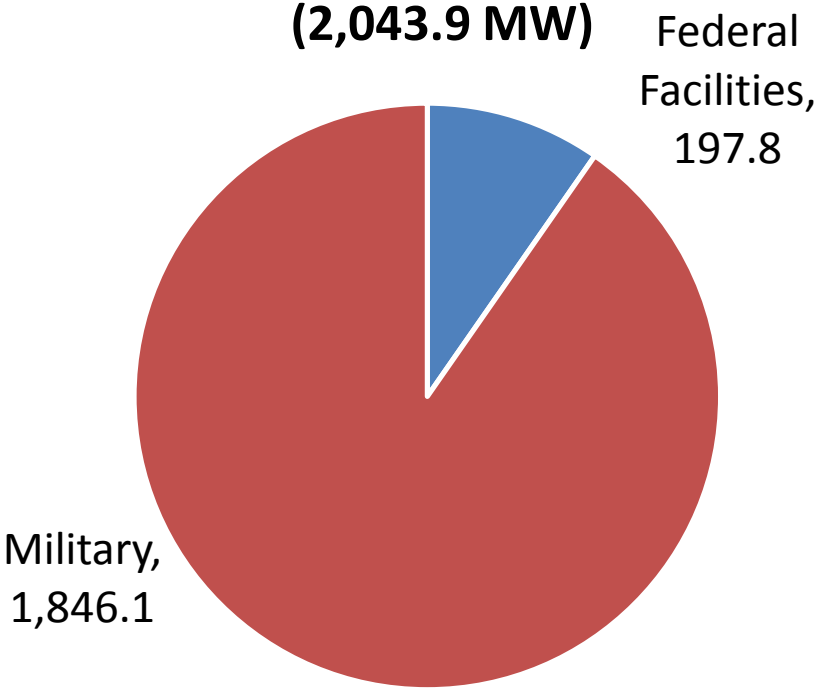
Facility types include large campuses, hospitals/medical centers laboratories/research buildings, industrial, office buildings, data centers

CHP Technical Potential in Federal Facilities

CHP Technical Potential by Sites (996 Sites)

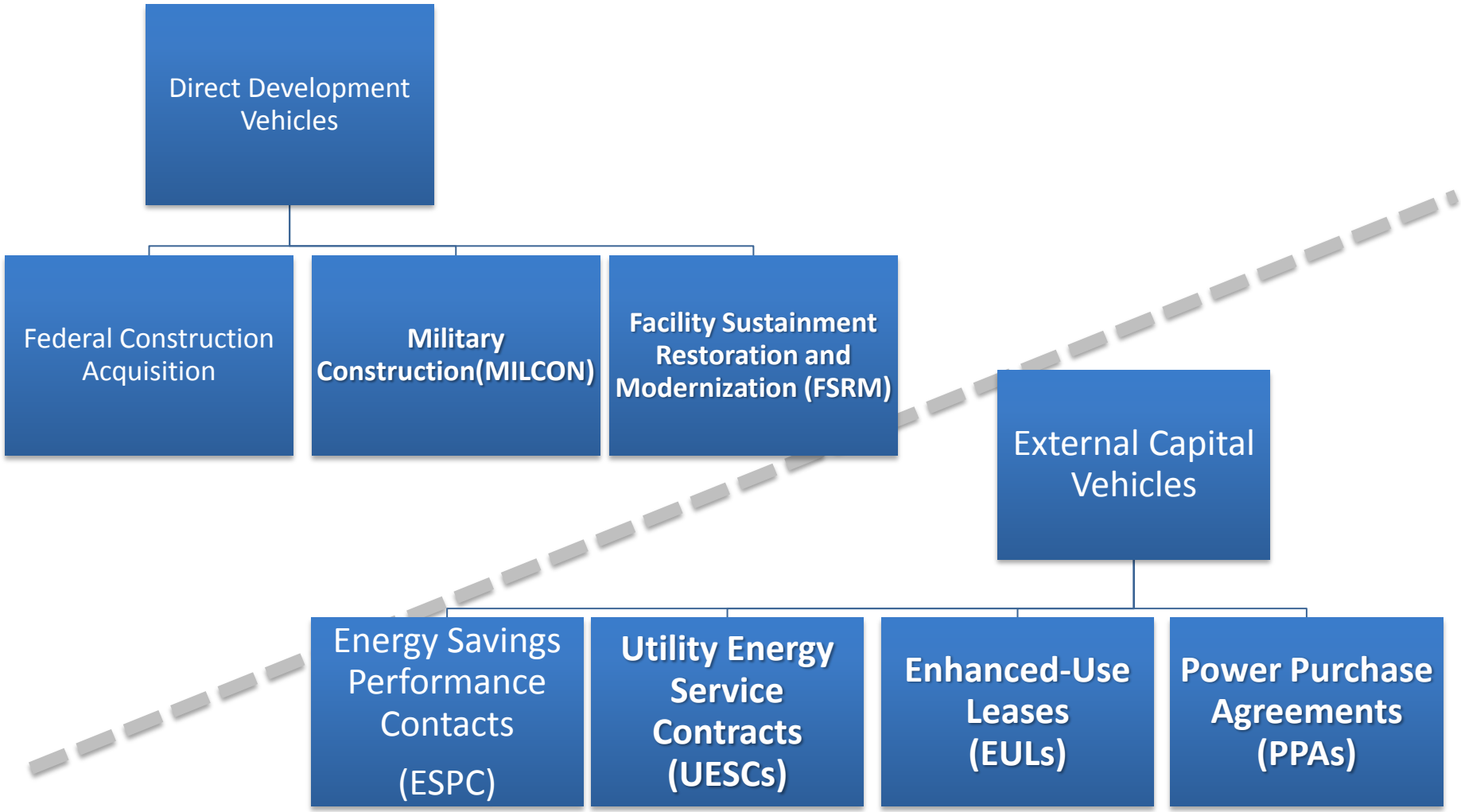


CHP Technical Potential by MW (2,043.9 MW)



Source: ICF CHP Technical Potential Estimates, 2013

Federal CHP Project Finance Options

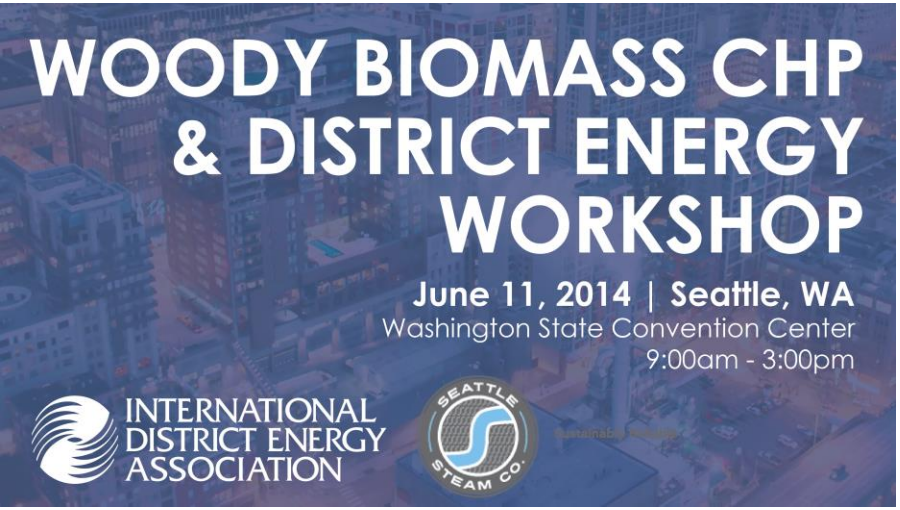


Five ways to advance CHP development opportunities

- Evaluate CHP as an *energy efficiency strategy* to help meet energy and emissions reduction goals
- Consider CHP as a key resource to meet *renewable energy* portfolio targets or goals
- Examine *new facility and facility modernization planning* policies for proper evaluation of CHP options
- Review *critical infrastructure and energy resiliency* needs and role of CHP with district energy and microgrids
- Partner with DOE / CHP TAPs on an *agency-wide CHP market assessment* to identify cost-effective projects

A professional development and partnership opportunity:

DOE CHP TAP / IDEA Biomass CHP Workshop



The DOE Northwest CHP TAP has partnered with the International District Energy Association to deliver a biomass CHP tour and workshop on 11 June 2014 in Seattle. Federal facility managers, district energy professionals and project developers will gain knowledge on:

- The special challenges and considerations in developing biomass CHP;
- Provide guidance to avoid what, for some, have been very hard lessons learned;
- Provide an overview, perspective and context for development of biomass CHP project
- Tour Seattle Steam biomass CHP facility
- http://www.idea2014.org/
- Contact us if you would like to see an event in your area!

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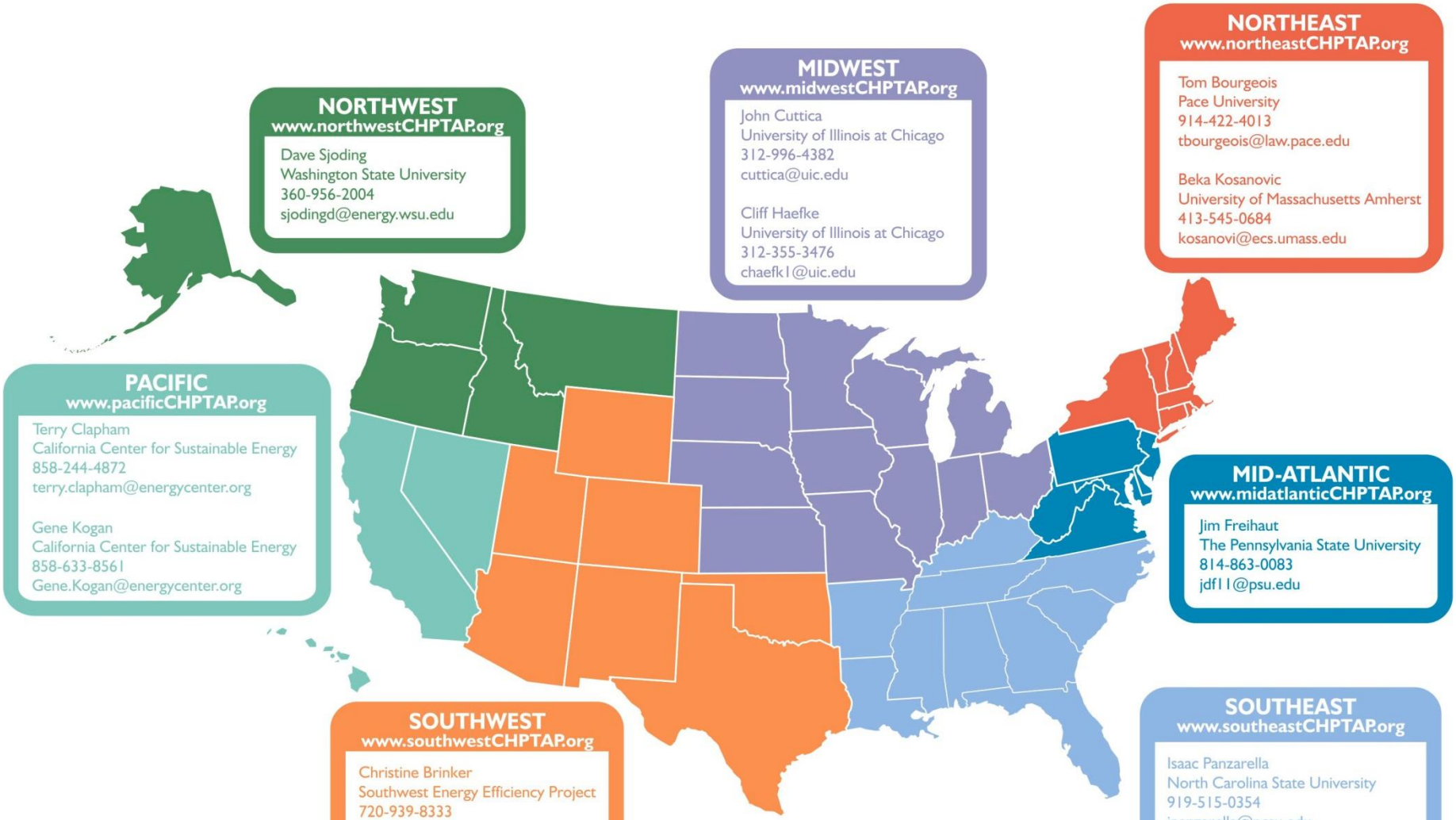

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