

# Combined Heat and Power (CHP), Decarbonization, and Federal Incentives

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**CHP Technical Assistance Partnerships**

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# DOE CHP Technical Assistance Partnerships (CHP TAPs)

- **Technical Services**

As leading experts in CHP (as well as microgrids, heat to power, and district energy) the CHP TAPs work with sites to screen for CHP opportunities as well as provide advanced services to maximize the economic impact and reduce the risk of CHP from initial CHP screening to installation.

- **End User Engagement**

Partner with strategic End Users to advance technical solutions using CHP as a cost effective and resilient way to ensure American competitiveness, utilize local fuels and enhance energy security. CHP TAPs offer fact-based, non-biased engineering support to manufacturing, commercial, institutional and federal facilities and campuses.

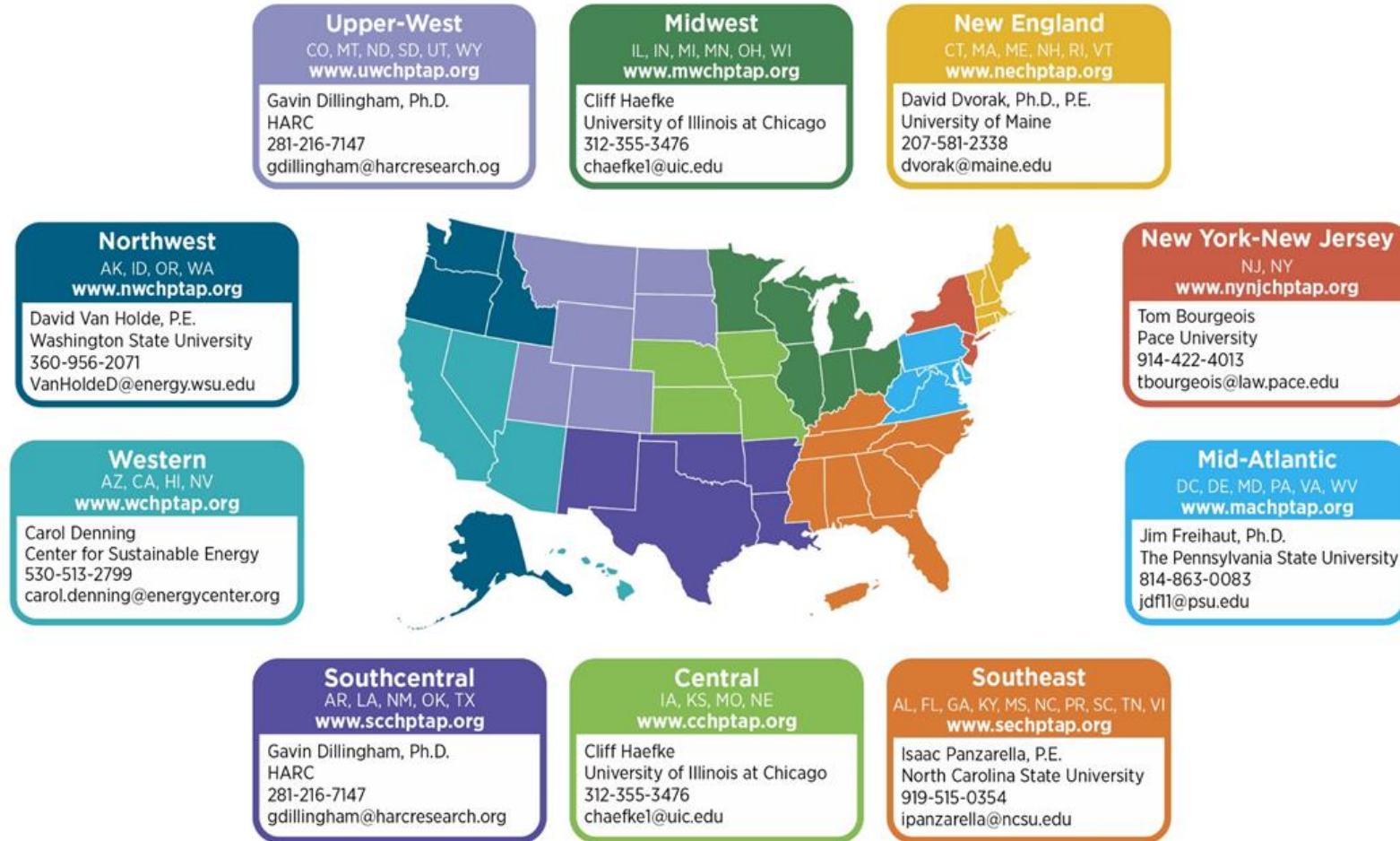
- **Stakeholder Engagement**

Engage with strategic Stakeholders, including regulators, utilities, and policy makers, to identify and reduce the barriers to using CHP to advance regional efficiency, promote energy independence and enhance the nation's resilient grid. CHP TAPs provide fact-based, non-biased education to advance sound CHP programs and policies.



- [energy.gov/chp](https://energy.gov/chp)
- [energy.gov/eere/iedo/articles/water-energy-and-future-farming](https://energy.gov/eere/iedo/articles/water-energy-and-future-farming)

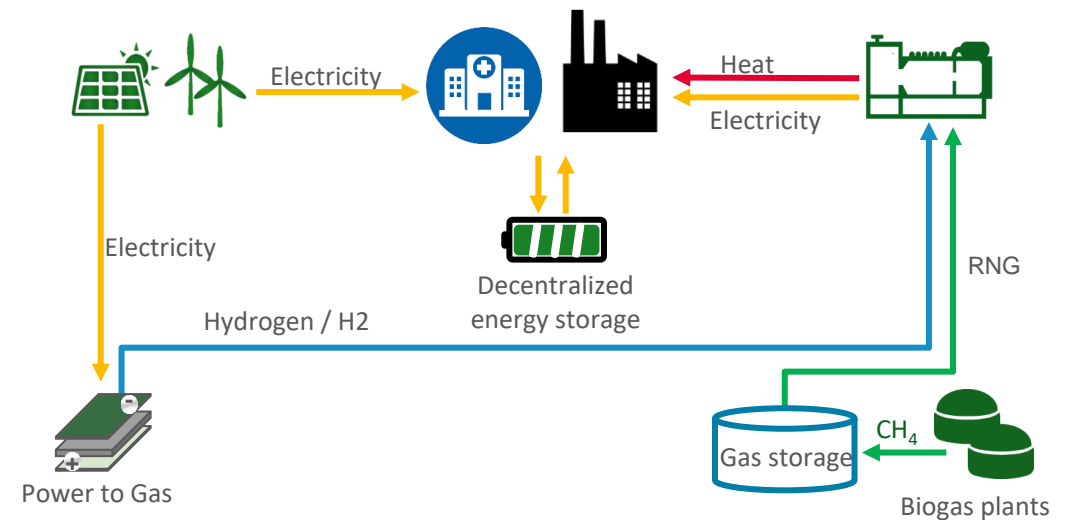
# DOE'S 10 Regional CHP TAPs



# CHP and Decarbonization

- **CHP is fuel flexible** - CHP currently uses renewable fuels, low carbon waste fuels, and hydrogen where available, and will be ready to use higher levels of biogas, renewable natural gas (RNG) and hydrogen in the future
- **CHP is the most efficient way to generate power and thermal energy**, and can reduce CO<sub>2</sub> emissions now and in the future
- Net-zero **CHP can decarbonize industrial and commercial facilities that are difficult to electrify**
- Net-zero **CHP can decarbonize critical facilities that need dispatchable on-site power for long duration resilience and operational reliability**
- CHP's high efficiency can **extend the supply of renewable, low carbon and hydrogen fuels**
- CHP can provide **dispatchable net-zero generation and regulation support to maintain the long-run resource adequacy of a highly renewable grid**

## CHP in a Decarbonized Economy

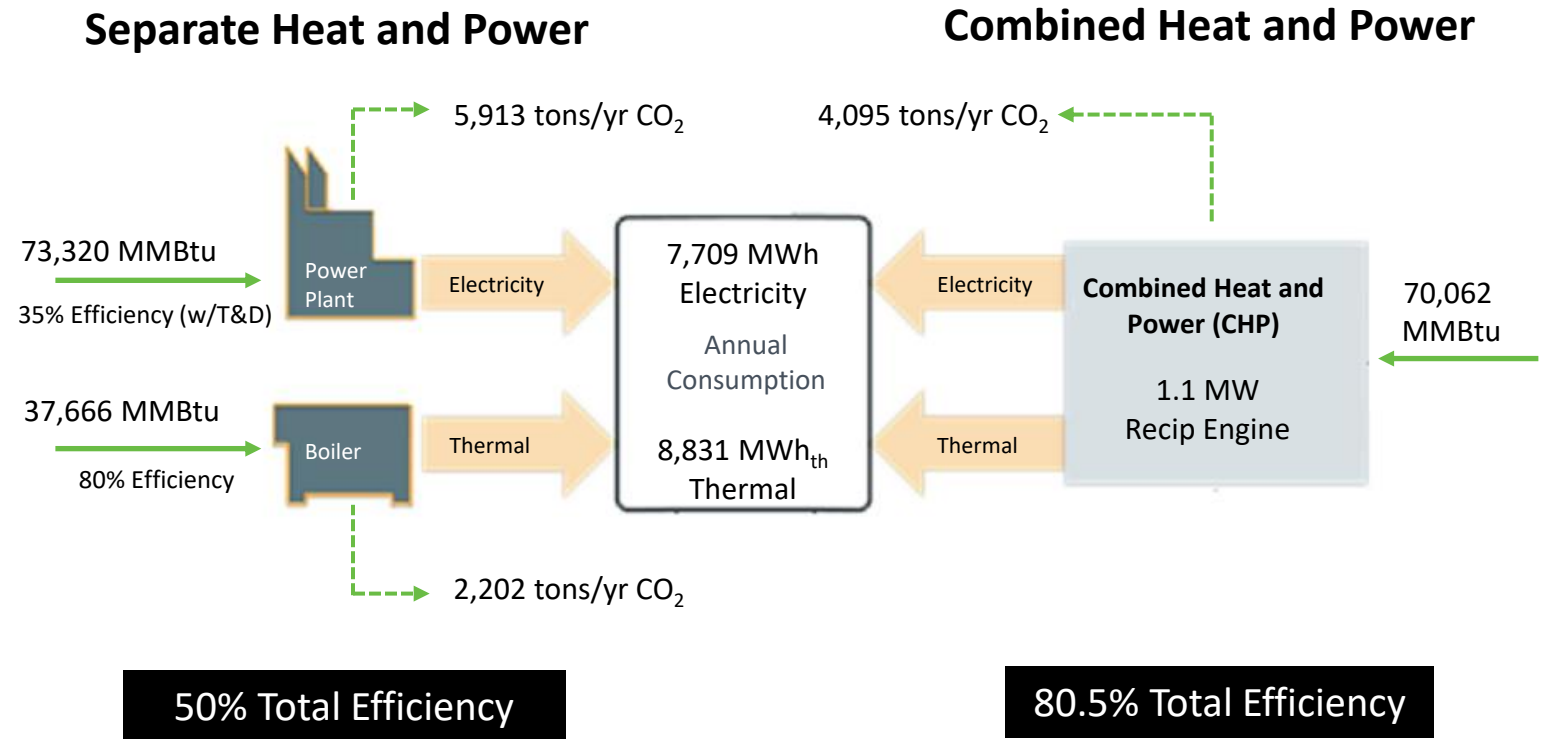


Source: Based on 2G Energy

# CHP Provides both Energy and CO<sub>2</sub> Emissions Savings

## 1.1 MW Reciprocal Engine CHP System

- Natural gas fuel
- 80% load factor (7,008 hours)
- 37.5% electric efficiency
- 4.3 MMBtu/hr hot water output
- 100% thermal utilization
- Displaces 80% efficient natural gas boiler
- CO<sub>2</sub> savings based on displacing EPA AVERT Uniform EE grid emissions factor (1,534 lbs CO<sub>2</sub>/MWh)

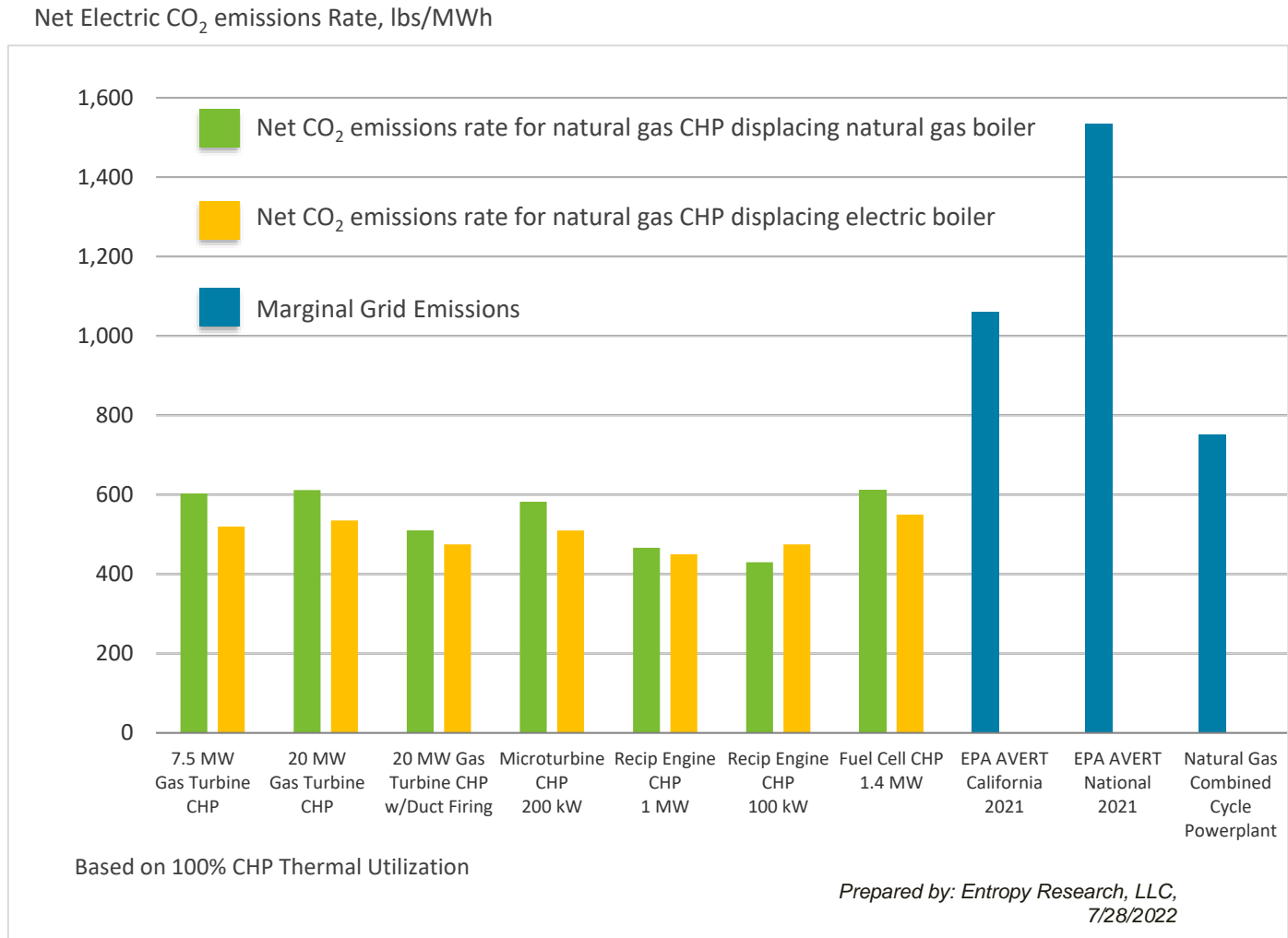


Energy savings: 40,834 MMBtu/yr  
CO<sub>2</sub> Savings: 4,019 tons/yr

Prepared by Entropy Research, LLC, 7/28/2022

# Natural Gas CHP Emissions vs Marginal Grid Emissions

- Natural gas CHP systems have lower net GHG emissions in terms of lbs CO<sub>2</sub>/MWh than current marginal grid generation
- Natural gas CHP displacing natural gas boilers provides emissions savings as long as the marginal grid emissions factor is above 430 to 675 lbs CO<sub>2</sub>/MWh
- Natural gas CHP displacing electric boilers provides emissions savings as long as the marginal grid emissions factor is above 475 to 565 lbs CO<sub>2</sub>/MWh
- Current marginal grid emissions factors range from 1,081 lbs CO<sub>2</sub>/MWh in California to 1,925 lbs CO<sub>2</sub>/MWh in the Rocky Mountain regions based on 2021 EPA AVERT data (1,534 national avg)



# Federal Incentives for CHP – IJA/BIL

- **Section 40521 - \$400M**

- Grant funds for manufacturers – up to **\$300,000** in matching funds
- Must have **screening by CHP TAP, DOE IAC** or like to qualify

- Resources:

- <https://www.energywerx.org/opportunities/iac-round-2>
- <https://www.energy.gov/mesc/industrial-research-and-assessment-center-implementation-grants>
- <https://energycommunities.gov/>

- **Section 40209 - \$750M**

- Grant funds for facilities in regions with coal mine or coal fired electricity unit closures

- **Section 40534 - \$50M**

- Financial assistance to States to establish programs – Support Smart manufacturing
- Provide access to computing resources at National Labs





# Federal Incentives for CHP – Inflation Reduction Act (IRA)

- Investment tax credits (ITC)

- 6% Base Rate for ITC
- **30% CHP ITC Bonus Rate**
- **Additional Tax Credits** (maximum of 50% combined)
  - 10% ITC for Domestic Content
  - 10% in Brownfield site
  - 10% Energy Community
- **Conditions**
  - Prevailing Wage
  - Apprenticeship Requirement
  - 1MW and under are exempt
- **Non-taxable entities (Nonprofits-State/Local Gov)**
  - Qualify for ITC through **Direct Pay** program

- Resources:

- <https://www.whitehouse.gov/cleanenergy/inflation-reduction-act-guidebook/>
- <https://www.irs.gov/credits-and-deductions-under-the-inflation-reduction-act-of-2022>
- <https://www.energy.gov/infrastructure/qualifying-advanced-energy-project-credit-48c-program>
- <https://energycommunities.gov/>





# CHP and IRA Investment Tax Credit

Tax Credit Differences Before and After IRA



- ITC for Natural Gas CHP sunsets: **12/31/24**
- End Users must Safe Harbor 5% of project cost by 12/31/24 to qualify for ITC
- ITC for CHP starting 2025 must be 100% renewable fuel

# US DOE CHP Program Resources: [energy.gov/chp](http://energy.gov/chp)

## CHP and Microgrid Installation Databases



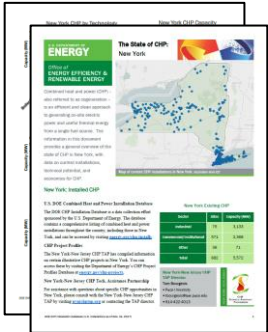
## Packaged CHP eCatalog



## DOE CHP Technologies Fact Sheet Series



## State of CHP Pages



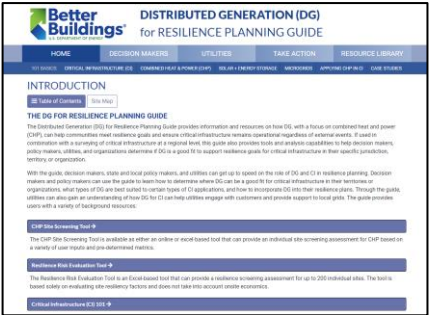
## DOE Project Profile Database



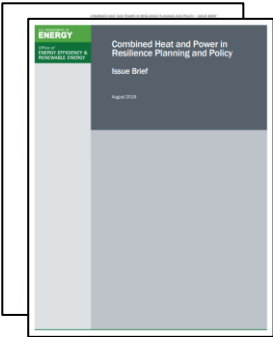
## DOE Policy/ Program Profiles



## DG for Resilience Planning Guide



## CHP Issue Brief Series



# Thank you!

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- Starting Jan 1, 2024:
  - DOE Onsite Energy Technical Assistance Partnerships
    - <https://www.energy.gov/eere/iedo/onsite-energy-program>
  - Contact [onsiteenergy@ee.doe.gov](mailto:onsiteenergy@ee.doe.gov) for more information.



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