
**TECHNICAL CONFERENCE ON IMPLEMENTATION ISSUES UNDER THE PUBLIC UTILITY REGULATORY POLICIES ACT OF 1978**
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## COMMENTS OF THE INDUSTRIAL ENERGY CONSUMERS OF AMERICA

The Industrial Energy Consumers of America (IECA) is a nonpartisan association of leading manufacturing companies with $1.0 trillion in annual sales, over 2,900 facilities nationwide, and with more than 1.6 million employees. It is an organization created to promote the interests of manufacturing companies through advocacy and collaboration for which the availability, use and cost of energy, power or feedstock play a significant role in their ability to compete in domestic and world markets. IECA membership represents a diverse set of industries including: chemical, plastics, steel, iron ore, aluminum, paper, food processing, fertilizer, insulation, glass, industrial gases, pharmaceutical, building products, automotive, brewing, independent oil refining, and cement.

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## PANEL 1: MANDATORY PURCHASE OBLIGATIONS

**1. Application of the "one-mile rule," including implications of the "one-mile rule" on current electricity markets and its implications for utilities' long-range resource planning efforts.**

Manufacturing QFs who develop CHP/WHR projects are not a party to this controversy. However, if it is found that wind and solar qualifying facilities (QFs) are applying the "one-mile rule" in a manner that takes advantage of the PURPA mandatory purchase obligation provision, then changes should be made to the rule to protect ratepayers. One suggestion is to make the one-mile rule rebuttable so that utilities can challenge its application if they suspect it is being misused.

**2. The rebuttable presumption that the Commission has adopted in the context of PURPA Section 210(m) that QFs 20 megawatts and below do not have nondiscriminatory access to competitive organized wholesale markets and the barriers to access encountered by these facilities.**

IECA supports retaining the PURPA rebuttable presumption for application to industrial CHP/WHR facilities that are 20 MWs or less. We believe that the intent of PURPA, that is, to increase energy conservation (energy efficiency) is still as important today as it was in 1978 and remains a very high public interest. In fact, it may be a higher priority today because of the need to reduce GHG emissions and maintain and increase high paying manufacturing jobs which are under constant threat from foreign production, reduce a staggering manufacturing trade deficit and reduce GHG emissions. The 2015 U.S. manufacturing trade deficit stands at $627 billion and 61 percent of the deficit is with one country, China.

Manufacturers configure CHP units to supply internal demand for steam and power in the most efficient manner possible. From an operational standpoint, the priority will always be to produce enough steam to keep the manufacturing process operating with less regard to how much electricity is produced. In other words, the manufacturing facility will never jeopardize production of its products to increase production of electricity. At the same time electricity production is an important by-product because it enables the manufacturing facility to be more competitive in global markets for their products.

The purchase obligation provides necessary protections for small projects with limited resources. Usually, it is only the utility that has the modeling and study information that can be used as an obstacle to QF development. This information can also be used to rebut the presumption that small QFs do not have access to competitive markets. Small QFs seldom have the information or knowledge of the transmission system and study assumptions to show that discrimination exists. For these reasons the 20MW rebuttable presumption should be retained.

Manufacturers that have units 20 MW or smaller in size do not have the expertise to sell the power to wholesale markets. The quantities usually available to sell into the market are so small, that it makes it impractical to establish the personnel and expensive back-office resources necessary to do so. In addition, requiring such entities to become a market participant presents a significant challenge. For example, if a QF became a market participant and offered a quantity of power into the day ahead market and the QF was unable to deliver that amount, then the QF would be subject to true-up in the real time market. If there is volatility between the day ahead and real time rate, then the QF will be exposed to the risk of the price differential. If the price moved against them, the costs could be so high that it makes little financial sense to risk selling into the day ahead market at all. As a result, the QF would most likely be limited to selling into the real time energy market and forego the opportunity to know the value of that power on a day ahead basis or to secure a capacity payment from the market. Finally, from a practical perspective, it should not be a burden for an electric utility to take these small increments of “as available” power from QFs that are CHP/WHR at avoided cost. The utility with whom the QF is interconnected is the logical “off-taker” of this energy.

If the rebuttable presumption were removed, the manufacturer would still need to get rid of the power that it cannot use internally. Because of the large financial risks of selling into the market versus the limited financial gains, we believe that most less than 20 MW units would reconfigure their units to produce less power so that there is never a possibility of an export taking place. This would reduce the energy efficiency benefits of the CHP facility which PURPA was designed to promote.

If FERC were to consider changes to the rebuttable presumption, there should be consideration given to altering the minimum threshold so that it is based on "total energy" (MWh) exported to the grid, not on net system capacity. The current regulation unfairly discriminates against industrial CHP/WHR in favor of entities, such as merchant wind and solar projects that are in the business of producing electricity for sale. It is entirely possible that an industrial CHP/WHR installation with a net generating capacity exceeding 20 MW (and typically a much higher overall capacity factor than merchant wind or solar), may still export far less total electricity to the grid than a wind or solar facility of similar or even smaller capacity. Facilities that export small amounts of power should not be classified as either large or small based on the size of the net generation system. The classification should be based on the maximum amount of power that potentially can be exported to the grid under normal operating conditions of the manufacturing facilities at which the CHP/WHR facility is located.

Utilities are currently afforded the opportunity to challenge or rebut the presumption that QFs smaller than 20 MW in size do not have nondiscriminatory access to competitive markets for their output. The opportunity to rebut should be retained. Utilities can rebut this presumption on a case-by-case review of each CHP/WHR QF to assess whether they have non-discriminatory access to markets. In evaluating such challenges FERC would need to consider multiple factors that include: physical configuration, operational considerations, and federal and state legal and regulatory issues. We note that it is not appropriate for a regulatory agency such as the FERC to change the energy conservation requirements and goals embedded in PURPA or to propagate new rules that would effectively result in this outcome.

**3. When a QF can be curtailed.**

To address the curtailment issue, it is important to acknowledge that not all generation resources are similar with regard to reliability, capacity, and total economic impact of curtailment to the electric generator. All three are important factors that should be considered when decisions are made to curtail generation. If a need to curtail generation arises, it is because there is more generation available than needed to meet the instantaneous demand. At this point the price signals in the energy market should have already reduced the thermal generators' output to absolute minimum levels. The remaining generation on the system will be QFs, nuclear, hydro and some natural gas generation. Since it is not practical to curtail hydro or nuclear, the next choices are QFs and the remaining natural gas generation units.

IECA believes that QFs that are small power producers under 80 MW or less should be curtailed before QFs that are CHP/WHR units. This is because the overall impact to the

economy will be less as wind and solar electric generating units do not have an entire manufacturing site tied to them. Industrial CHP/WHR facilities are the backbone of the manufacturing facility which provides continuous economic benefits for the communities in which they operate. CHP/WHR helps the manufacturer lower its steam and electricity costs, which improves competitiveness, increases investment and job creation, and may increase exports of the products that are created. In contrast, the overall economic benefits of wind/solar facilities are far less.

Industrial CHP/WHR facilities should only be curtailed if the grid is truly in an emergency situation and the stability of the grid is being threatened. The CHP/WHR facility should only be curtailed down to a net zero export position. CHP/WHR facilities are often located in remote rural locations and can provide much needed voltage support. Therefore CHP/WHR QFs should not be curtailed below a net zero export position. In the reverse situation where the grid becomes unstable because there is insufficient generation to meet instantaneous demand, CHP/WHR units have the ability to shift their load/generation profile to actually help stabilize system loads to reduce the impact of grid capacity shortfalls. Such assistance from CHP/WHR units would enable the grid operator to avoid triggering cascading blackouts. CHP/WHR units are reliable and run continuously when they are serving a manufacturing facility. The CHP unit is producing steam and electricity that is essential to keeping the associated manufacturing facility operating. If the entire CHP facility is curtailed (and not curtailed only to zero export level), then the entire manufacturing facility will not be able to operate efficiently and as stated above there will be significant economic harm. The manufacturing facility will incur great financial loss which includes lost production, and operating expenses to shutdown and then start-up of the entire manufacturing facility. Hundreds, if not thousands, of employees would not be able to work. These costs are significantly greater than shutting down facilities such as wind and solar, natural gas, or even coal-fired production facilities. CHP/WHR should be the last in the queue to be curtailed right before nuclear and hydro units.

Policies that deal with curtailment need to address the problem of the aggregated unpredictable impact of wind and solar facilities. While there may be several wind and solar facilities in a given region, they are a block of resources that act together with important implications for the grid. This means when the wind is not blowing and/or the sun is not shinning, “all” of the turbines in the region are not turning/generating electricity and/or all of the solar panels are not generating electricity. As such, wind and solar facilities have a disproportionate impact. In contrast, CHP/WHR units act alone at the single industrial site where they are installed (i.e. a condition at one CHP/WHR unit will not impact another CHP/WHR unit in the same region).

**4. The impact of utility interconnection practices on QF transactions.**

IECA supports the development of a streamlined interconnection approach specifically designed for CHP/WHR QF units that are part of a manufacturing facility in order to lessen the burden of interconnection for those QFs. The reason for this is that industrial CHP/WHR are not in the business of selling power, yet units greater than 20 MWs are required to go through the same FERC or RTO interconnection process for large

generators, just like an electric generating utility unit. This subjects the CHP/WHR QF to considerable expense, time, and dedication of people resources to go through the interconnection process. This is not necessary and discourages potential QFs from pursuing the CHP/WHR project.

*Interconnection costs and cost allocations:*
All QFs should pay the upfront cost of upgrading the transmission system as part of the interconnection process if the QF wants to become interconnected as a capacity resource. FERC accepted a proposal made by MISO to allocate transmission upgrade costs across the entire MISO footprint on an energy basis for certain types of new transmission facilities as "just and reasonable" despite longstanding FERC policy to allocate transmission costs on a demand basis. This decision was made to lessen the cost burden on utility systems located in parts of the MISO where wind power is being built.

These high voltage facilities are called Multi Value Projects (MVPs) in the MISO. FERC stated that it is just and reasonable to socialize the cost of new infrastructure needed for the development of renewable energy projects over the entire MISO footprint and not just to the QF seeking the interconnection. It is inconsistent with cost causation principles to charge all MISO transmission owners for transmission upgrades for MVPs on certain parts of the system where they will not derive any benefit. Furthermore, allocation of these costs on an energy basis is unfair to energy-intensive high load factor manufacturers who purchase power from utilities in the MISO footprint because this allocation methodology imposes a much larger share of these cost burdens on those specific customers.

We believe that there are jurisdictions, where the interconnection costs of small renewable facilities are subsidized by ratepayers. FERC should provide guidance to states and RTOs/ISOs to revert back to the allocation of transmission costs based on demands created on the system, not on energy used. In addition, transmission upgrades needed for QFs to become capacity resources should be borne by the QF seeking the interconnection and not socialized to consumers across a wide footprint when those consumers will not derive any quantifiable or tangible benefit from these projects.

**5. The obligation to purchase "as available" power.**

It is important to retain the obligation of utilities to purchase "as available" power from CHP/WHR facilities, particularly in jurisdictions where there are non-competitive or non-existing transparent wholesale power markets. It was the clear intent of Congress through PURPA to protect CHP/WHR and other QFs from discriminatory treatment.

Unfortunately, as there have been so many times in the past, there is an ongoing effort to suggest that the mandatory purchase obligation is no longer needed in states if the purchase is not necessary to meet the utility's obligation to serve or if the utility conducts an RFP. The obligation to purchase "as available" power is still needed as it is essential to the operation of CHP/WHR facilities. FERC should not sanction any state action that would undermine the "must buy" obligation as this would be contrary to the very reason Congress enacted PURPA in the first place.

The loss of obligation to purchase "as available" power would diminish the value of the excess power produced and would likely result in CHP/WHR facilities voluntarily reducing power production due to having no viable market available for its sale. CHP/WHR operators would subsequently incur the previously mentioned inefficiencies and losses associated with reduced power production. Putting excess power to the grid without requisite authority to do so or submitting a schedule that does not reflect actual excess power generated may subject the CHP/WHR facilities to imbalance penalties. QFs need the ability to "put" power to the local utility on an "as available" basis.

**6. The obligation to sell supplemental, standby (backup) and maintenance power to a QF.**

The obligation to provide supplemental, standby (backup) and maintenance power to a QF at just and reasonable rates should be retained as these services are essential to the viability of industrial CHP/WHR facilities. Guidance for development of rates for these services was provided by the FERC in Section 292.305. These principles specify that the design of rates for these services should not be based under the assumption that forced outages by QFs will occur simultaneously or during the system peak, or both. Although the FERC provided such guidance/principles to the states on parameters to consider when designing these rates, the actual rate designs vary greatly by state and utility system. This is because the states that were unfriendly to PURPA largely ignored this guidance and approved rate designs that actually discouraged industrial companies from building CHP/WHR facilities. Properly designed standby and maintenance rates should be "just and reasonable," based on "cost causation" principles outlined by the FERC.

Some electric utilities charge disproportionate charges for capacity and transmission in the event that there is even the slightest trip of the CHP/WHR unit that is not coincident with their peaks. This becomes very costly to the QF if the demand charges for standby service ends up being very similar to the demand charges for full retail service. IECA recommends that FERC further encourage states to design rates for these services based on the load the QF contributes that is coincident with the total loads at the system peak. An alternative, less volatile approach, would be to design standby rates assuming that these services will only be required 10-15% of the time and rarely, if ever, during the system peak. This principle is applicable to allocation of generation (capacity) and transmission costs.

**7. The impact of emerging energy imbalance market in the West may have on the mandatory purchase obligations**

"Balancing markets" do not qualify as a "comparable markets" under 210(m)(1)(c). Balancing markets vary greatly, can be of poor quality and most typically lack liquidity. The imbalance penalties alone are a reason alone why use of these less than fully developed markets should not be allowed to relieve utilities of the mandatory purchase obligation. Manufacturers with CHP units are risk adverse. Imbalance markets are real time markets which do not provide pricing certainty on a day ahead basis. Participation in energy imbalance markets may also require dispatchability that is impractical for

CHP/WHR facilities or is inconsistent with the energy efficient operation of the CHP/WHR facility.

Energy imbalances caused by renewable resources result in unrecognized cost imposed on ratepayers because utilities and RTOs have to fill the voids caused by this resource's intermittency with other resources. These incremental costs are not considered in developing avoided costs for these facilities. IECA encourages FERC to address this issue. However, we do not believe that CHP/WHR units tied to manufacturing facilities are contributing to this problem because their intermittent sales of excess power are relatively small.

Intermittent wind and solar units can submit negative bids thereby depressing energy clearing prices for all resources including base load resources. They can submit negative bids because the value of the federal Production Tax Credit (PTC) and the Renewable Energy Credit (REC) are typically included in their bids. This distorts the market, creates unfair advantage and makes it harder for other resources to compete. In addition, if thermal base load power plants do not get dispatched because they do not clear the market they will lose value, ultimately resulting in permanent premature shutdown. In regulated markets ratepayers pay for electric generation plants that are shut down before their useful lives have been met. As the percentage of renewable energy in the market increases going forward and load growth is low or nonexistent, more base load power generating facilities will not be dispatched to run. Eventually those plants will be shut down prematurely. U.S. policymakers should carefully review what has already happened in the UK and German electricity markets as a clear warning.[1]

At the same time, imbalances created by renewable resources may potentially make the grid unstable. PJM has stated that they can absorb about 30% renewables on their system but that grid resiliency will have to be studied and any issues identified will have to be addressed if the studies show there are concerns when renewables exceed those percentages. Although each part of the country has their own unique set of circumstances at play, it is clear that as the percentage of renewables increases, grid operators will become more and more challenged to maintain grid balance.

## PANEL 2: AVOIDED COST CALCULATIONS

The design of avoided cost rates was delegated to the states by PURPA. The most important issue for ratepayers is paying the lowest cost for each utility capacity addition whether through utility construction or via a PPA with a QF.

**IECA Recommendation #1:** IECA encourages FERC to improve its guidance to states for the determination of avoided cost. Avoided costs should be reasonable and fair and equitable to both the QF and ratepayers.

[1] "How Renewables Killed the British Energy Market". "Amber Rudd: end to pursuit of green energy at all costs", Telegraph, November 15 2015

Avoided costs should be comprised of both avoided energy and avoided capacity components. However a capacity payment should only be offered if the IRP shows that additional capacity is needed or the utility is adding certain capacity regardless of need to fulfill state policy objectives. The QF should enable the utility to defer this new construction or delay entering into the PPA for that capacity. "Energy only" avoided costs should be established if the utility is not seeking to install new capacity.

IECA believes that the Differential Revenue Requirements (DRR) approach for establishing avoided cost for energy is a proven and workable approach that pays the QF a fair avoided cost rate for energy at the retail level. The DRR approach uses the utility model and their projected total costs of operating their system with and without a specified block of QF power. These models can be PROMOD or other utility cost modeling programs. The block can be either 100 MW or 200 MW depending on the state's interests. The avoided energy rate is the difference between the results of these two modeling runs. The results can be broken down into on-peak and off-peak energy rates and if desired, can be further differentiated on a seasonal basis. So the QF can have up to six different energy rates: on-peak and off-peak summer, on-peak and off-peak winter, and on-peak and off-peak shoulder. This calculation should be done on an annual basis in an open and public PSC proceeding in advance of the upcoming year so that QFs can review the calculations and have some certainty of the payments they will receive for energy in the upcoming year. This methodology will reduce the use of long-term energy forecasts in proxy units for developing avoided cost energy rates and will prevent avoided costs for energy from deviating significantly from the actual costs avoided by the utility.

Avoided cost payments for capacity should be based on the utility's stated need for capacity as outlined in the utility Integrated Resource Plan (IRP). If the utility does not produce an IRP, then the unit of capacity that is used for this calculation should be based on the utility's public statements of their future capacity needs. Those needs can be either to meet load growth or to fulfill other state policy objectives. The avoided cost rate for capacity should be offered for a minimum ten-year term. This would give the QF some pricing certainty, which can be relied on to obtain financing.

When power generated by the CHP/WHR facility is physically used onsite by the manufacturing steam host, transmission and distribution line losses are reduced as well. These line loss savings can be up to 7%. Avoided cost calculations should continue to include a line loss adjustment for QFs that use the power at an adjacent consuming site and not if the power is transmitted some distance to get to load.

**IECA Recommendation #2:** Avoided cost calculations for wind and/or solar facilities should account for the cost associated with under-utilizing existing electric generation capacity when wind/solar are generating power.

States should consider the additional costs imposed on the system by intermittent QFs and reduce the avoided cost rates to those QFs accordingly. Wind and solar are intermittent and operate at less than a 30 percent average capacity factor. The utility that buys QF power from such intermittent resources incurs additional costs to integrate that

resource into their mix. The avoided cost rates paid to such intermittent resources should therefore be adjusted downward to reflect these additional costs incurred by the buying utility.

**IECA Recommendation #3:** FERC should provide guidance to states to ensure that capacity and energy costs are appropriately allocated to the rate classes after the functional separation is done properly.
Equally important is how these costs are allocated. In regulated jurisdictions the capacity portion of the PPA should be added to the utility's base rates while the variable energy portion should be included in the fuel rate.

**IECA Recommendation #4:** FERC should provide guidance to states regarding the review of Purchase Power Agreements (PPAs) such that state commissions are required to hold a public proceeding on the merits of the PPA prior to the state commission decision-making.

Transparency is sound public policy. We find, all too often that state commissions do NOT hold such proceedings. Since PPAs have the potential to raise electricity rates and that state commissions always have generation alternatives, ratepayer participation should be included in the approval process.

## DIFFERENCES BETWEEN INDUSTRIAL CHP/WHR VERSUS WIND AND SOLAR ELECTRIC GENERATING FACILITIES

### 1. Manufacturer owners of CHP/WHR facilities are large consumers of electricity and support policies that ensure that electricity costs are low and supply is reliable.

As manufacturing companies address the important issue of PURPA and CHP/WHR facilities, policymakers should appreciate that we are also very large consumers of electric power. For that reason, we support policies which result in ensuring that electricity costs are low and that supply is reliable. According to the Energy Information Administration (EIA), in 2014 industrial CHP generation was 144,083,155 MWh while total manufacturing sector electricity consumption was 997,576,138 MWh or 14.4 percent of the total consumption. The manufacturing sector consumes 26 percent of U.S. electricity. Large merchant wind and solar qualifying facilities (QFs) are not large consumers of power, so they have completely different motivations. Their electricity purchases would usually only cover the facility parasitic load when their QF is running and emergency operations when the QF is not running.

### 2. Large merchant wind and solar facilities are in the business of generating and selling power. Manufacturers are in the business of selling their "products."

Manufacturing companies do not build CHP/WHR facilities to sell power. Industrial CHP facilities are designed primarily for steam generation and electricity is a by-product of producing steam at process pressure levels. Industrial WHR facilities convert by-product

heat which is otherwise released to the atmosphere into power. CHP is substantially more energy efficient than stand-alone steam and power generation.

Excess power is sometimes sold into the wholesale market where Regional Transmission Organizations (RTOs) exist and the utility has been relieved of their PURPA based must-take obligation. Excess power is also sometimes sold to the local electric utility at the electric utilities' avoided cost.[2] This avoided cost is the cost for both energy and capacity that the utility avoids from buying from the QF, as opposed to obtaining that same amount of power using their own generation and other alternatives. In some jurisdictions the avoided costs of the utility for capacity are based on the next type of unit the utility says they need/want to install as established in their IRP, but not always, as all utilities do not file IRPs. In other jurisdictions a proxy unit is used to determine avoided costs. The avoided cost methodology to be used and ultimately the rate is set solely by the agency that regulates the electric utility in a state and is completely independent of the manufacturing company's costs.

The need for a manufacturing company to sell excess power may be due to the most efficient and economic design of the facility. It may also be due to changes in the manufacturing process, such as when less steam from the CHP unit maybe required, while simultaneously less power is consumed than what is generated. This is because the steam produced in the boiler remains constant and steam that is not extracted from the turbine is pushed to the condenser, thereby producing more power. For WHR, the by-product power production varies with the manufacturing product throughput and demand.

**3. CHP/WHR facilities have higher positive economic impacts and create and sustain more jobs.**

Industrial CHP/WHR facilities are the backbone of the manufacturing facility which provides continuous economic benefits for the communities in which they operate. CHP/WHR helps the manufacturer lower its steam and electricity costs, which improves competitiveness, increases investment and job creation, and may increase exports of the products that are created. In contrast, most of the jobs and economic activity associated with wind/solar facilities are incurred during the construction phase and there are relatively few permanent jobs associated with ongoing operations.

**4. Manufacturing CHP/WHR facility connecting to the grid is not paid for by other ratepayers.**

Industrial CHP/WHR facilities, including the cost of connecting to the grid and any transmission costs to make that power deliverable to the load are paid for upfront by the manufacturer. If the interconnection request is for capacity and energy and the studies show that transmission upgrades are required to make the power deliverable to load, then the interconnecting CHP facility pays for the transmission upgrade upfront and are refunded those payments over time via credits on their bills for transmission service.

[2] "Avoided cost" is essentially the marginal cost for a public utility to produce one more unit of power.

There are jurisdictions where the interconnection costs of renewable facilities are subsidized, which means that the ratepayers are paying for it.

**5. CHP/WHR facilities can potentially be considered a capacity safety net for the utility or wholesale market, while wind/solar is intermittent.**

Manufacturers' CHP/WHR facilities run 24/7, producing steam and electricity to operate the manufacturing plant. In the event of a natural weather disaster, this electricity capacity has been called upon to provide desperately needed generation or to provide voltage support for the grid. Often, we find that the local utility or the market values the "potential" capacity provided by CHP/WHR facilities. It can potentially act as a "capacity safety valve." Wind and solar, on the other hand, are intermittent and operate at less than a 30 percent average capacity factor.

**6. CHP/WHR facilities avoid significant transmission and distribution lines and line losses while other QFs do not.**

When power generated by the CHP/WHR facility is used onsite by the manufacturing steam host, transmission and distribution line losses are reduced. These line loss savings can be up to 7%. No other QFs provide these line loss reduction benefits.

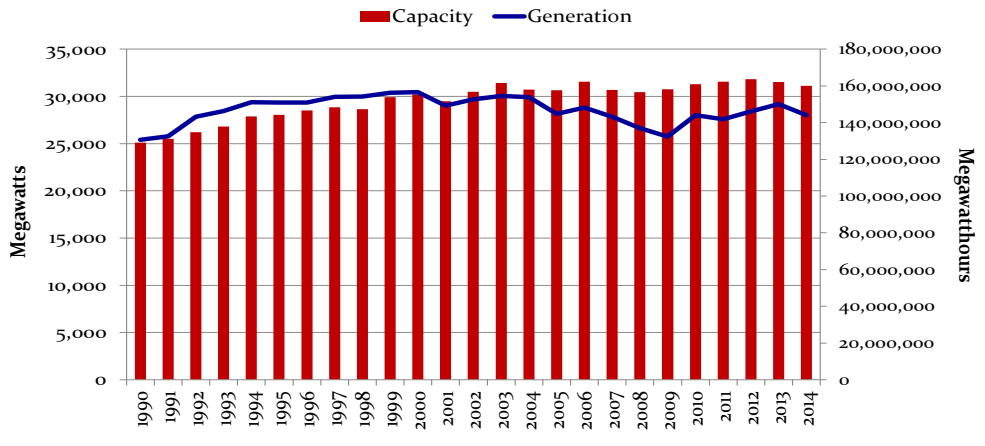
**7. Industrial CHP/WHR facilities avoid substantial quantities of emissions.**

*CHP is exceptionally energy efficient and avoids significant GHG and other criteria pollutant emissions:*
CHP facilities, while not emissions free, provide an immediate path to lower GHG and criteria pollutant emissions through increased energy efficiency and avoiding emissions from other less energy efficient fossil fuel burning electricity generating facilities. According to the U.S. Department of Energy (DOE), current existing CHP facilities avoid 248 million metric tons of carbon dioxide per year. Industrial CHP can produce electricity at up to 80 percent efficiency, as compared to around 34 percent for conventional coal or gas-fired combined cycle power generation and stand-alone steam production. CHP can use clean domestic energy sources, because over 83 percent of CHP capacity is fueled by natural gas, biomass, or waste fuels.

*WHR electricity generation is emissions free:*
WHR facilities use waste heat from the manufacturing process to generate power. As a result, WHR facilities do not generate additional emissions of any kind to produce power. This avoids GHG emissions that would otherwise be produced by the electric utility when generating that same amount of power.

Industrial CHP capacity has remained relatively flat over the period of 24 years.

# Industrial CHP Capacity & Generation




Source: EIA