



**Comments of the Northeast Combined Heat and Power Initiative on  
Massachusetts' Proposed RGGI Related Regulations**

**Submitted to the Massachusetts Department of Environmental  
Protection and the Massachusetts Department of Energy Resources**

On Proposed Rules:

310 CMR 7.70 - CO2 Budget Trading Program  
310 CMR 7.29 - Emissions Standards for Power Plants  
310 CMR 7.00 Appendix B(7) - Emission Banking, Trading, and Averaging  
225 CMR 13.00 - DOER CO2 Budget Trading Program Auction Regulation

**September 24, 2007**

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## I. Introduction

The Northeast Combined Heat and Power Initiative (NECHPI) appreciates the opportunity to submit these comments to both the MA DEP and the MA DOER regarding the draft rules implementing the Regional Greenhouse Gas Initiative “RGGI.”<sup>1</sup> NECHPI offers these comments to help Massachusetts meet its climate and energy challenges in a manner that promotes economic development and good jobs, reduces environmental impacts, improves the competitiveness of existing Massachusetts businesses and fosters greater energy security—all with a commercially available technology that dramatically increases the overall efficiency of energy use.

We strongly endorse the implementation of RGGI in general, and praise the thoughtfulness of the rule making process and in general the draft rules themselves. The decision to auction nearly 100% of the CO<sub>2</sub> allowances is particularly praiseworthy, as this will maximize the economic efficiency of the program, reduce the risk of misallocation, raise needed revenue to support further mitigation, and send the clearest price signals about CO<sub>2</sub>. We also specifically support the proposals to retire allowances for voluntary purchases of qualified renewable energy, and for use of the auction proceeds to fund energy efficiency and clean energy technologies.

### A. *NECHPI promotes the market acceptance of CHP (Combined Heat and Power) in Massachusetts and throughout the Northeast*

NECHPI is a regional organization, dedicated to the greater deployment of combined heat and power to enhance the economy and environment of our Northeast region. We are committed to doubling the use of CHP in the Northeast by 2010, a goal shared at a national level by the U.S. Department of Energy and the U.S. Environmental Protection Agency.

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<sup>1</sup> These comments are submitted to both the DEP and the DOER, with general reference to all of the affected regulations (listed below) with emphasis on 310 CMR 7.70.

- 310 CMR 7.70 - CO<sub>2</sub> Budget Trading Program (Cap and Trade system to control emissions of CO<sub>2</sub> from power plants in Massachusetts, based on the Model Rule that was developed as part of the Regional Greenhouse Gas Initiative.)
- 310 CMR 7.29 - Emissions Standards for Power Plants (The portion of the existing regulation addressing CO<sub>2</sub> emissions from six MA power plants will be modified and then replaced by 310 CMR 7.70.)
- 310 CMR 7.00 Appendix B(7) - Emission Banking, Trading, and Averaging (Regulation addressing GHG Credits will be modified and ultimately replaced by 310 CMR 7.70.)
- 225 CMR 13.00 - DOER CO<sub>2</sub> Budget Trading Program Auction Regulation (Regulations to establish rules for conducting auctions of CO<sub>2</sub> allowances created under the CO<sub>2</sub> Budget Trading Program (310 CMR 7.70), and to detail procedures for informing MassDEP about the number of allowances to be retired annually for voluntary purchases.)

NECHPI is an alliance of more than 40 regionally-based organizations, including CHP project developers and equipment manufacturers, electric and gas utilities, consultants, air regulators, state government agency representatives, universities and other organizations involved in the energy and environmental field. Through our regional activity we have gained the perspective necessary to apply lessons learned across various jurisdictions, and to foster best practices that maximize the societal benefits of CHP deployment.

NECHPI has long been involved in Massachusetts, and one of our priorities is to support CHP in the state. Demonstrating our involvement in Massachusetts, we have previously shared our expertise with the transition team that helped Governor-Deval Patrick develop his new agenda in the area of energy and environmental policy and frequently held our semi-monthly meetings here, including Cambridge in April of this year and more recently in Boston on August 30. In addition, we enjoy important relationships with researchers in the UMass system, members of Massachusetts industry who provide jobs, end users who seek to utilize CHP in this state, and Massachusetts environmental advocates.

***B. CHP's efficiency and GHG benefits merit its inclusion in RGGI implementation***

Combined heat and power (CHP), also called cogeneration, is the production of two or more forms of useful energy from a single fuel source. In most CHP applications, energy from a fuel such as natural gas is converted to both electrical and thermal energy used on-site, thus utilizing fuel energy very efficiently, avoiding line losses, and reducing greenhouse gas emissions. CHP can save about 40% of the energy input required by conventional systems that provide electrical and thermal energy separately. Most CHP installations in Massachusetts have conversion efficiencies over 60% or 65% compared to standard conversion efficiencies of 33%. Savings of this magnitude provide significant GHG mitigation and other advantages.

One of the primary values of CHP is *thermal* efficiency,<sup>2</sup> as a component of the overall efficiency improvement CHP provides over separate electrical and thermal supply. NECHPI members recognize the importance of thermal efficiency, importantly but not exclusively as a climate change mitigation measure, and among other goals we seek to encourage greater attention to the importance of thermal efficiency. The proposed RGGI rules take several steps to recognize this value.

CHP also contributes to improved electrical efficiency, particularly that portion of electricity generated that can fairly be considered a captured by product of waste heat, but more broadly through its ability to reduce the entire ecological footprint of energy use, including GHG emissions.

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<sup>2</sup> The term "thermal efficiency" can describe the measurement of converting fuel into mechanical work. We do not intend to limit our understanding to this limited definition. Rather, we stress the total efficiency of converting a fuel's potential energy into energy and useful work (useful work and energy output divided by higher heating value of input fuel), specifically including end use heating and cooling.

Thus, CHP has a role and should be considered in tandem with RGGI implementation because of its GHG mitigation potential generally, because of its emphasis on thermal efficiency that is recognized in the proposed rules, because CHP displaces carbon-intensive oil with less carbon-intensive alternatives, and perhaps most directly because of its connection to efficient electricity consumption.

**C. *Overview of Comments***

The NECHPI recognizes that the proposed regulations represent the culmination of a long and involved stakeholder process, and that many decisions affecting CHP have been settled, at least for the time being. Nonetheless, given the fast pace of change in Massachusetts energy policy, the possibility of further modifications to RGGI rules, the development of new offsets and other changes suggested in the “Next Steps” document, and pending decisions about how to prioritize use of the auction proceeds, we offer some general perspectives and proposals for further action. We also identify several technical issues and requests for clarification before the rules are finalized.

**II. *CHP Provides Numerous Climate Change Mitigation and Other Benefits***

**A. *CHP provides environmental and greenhouse gas mitigation benefits – including significant environmental co-benefits***

Two-thirds of all the fuel used to make electricity in the U.S. is generally wasted by venting unused thermal energy, from power generation equipment, into the air or discharging it into water streams. While other sectors of the economy have seen impressive energy efficiency gains since the oil price shocks of the 1970s, the average efficiency of power generation within the U.S. has remained around 33% since 1960. By contrast, integrated CHP or recycled energy systems significantly increase the efficiency of energy utilization, up to 85% efficiency, by using excess thermal energy from power generation equipment for cooling, heating and humidity control systems.

The electric power industry is only half as efficient at converting fuel into useful energy today as it was in 1920, largely because early power production tended to use CHP technologies. Thermodynamic principles suggest that any electricity grid that does not depend on CHP is destined to throw the majority of its energy away as waste heat.<sup>3</sup> If only half of this waste heat were recovered, the efficiency of energy use in most power plants could—and should—be increased by 50% or more, displacing fuel that would have otherwise been burned in a boiler or furnace.

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<sup>3</sup> Combined cycle gas turbine plants have achieved power-only efficiencies in the neighbourhood of 50% (higher heating value basis). However, our national power generation efficiency has been fixed at 33% since the mid 1950s in spite of gas turbine technological advances.

CHP systems and other methods of waste heat recovery reduce carbon dioxide and other emissions by displacing the need for boilers or electric air conditioning. When energy needs can be met by using heat that would otherwise be wasted up a smokestack, less fuel is burned. Thus, pollutants including SO<sub>x</sub> and NO<sub>x</sub> as well as greenhouse gas emissions are reduced.

These benefits are public, and provide a significant boost to Massachusetts' compliance with the new RGGI mandate. However, these benefits do not necessarily appear without appropriate policies, and a well-designed set of regulations and value streams that reward optimization can help maximize the mitigation potential of CHP.

***B. Additional benefits of CHP and on-site power make the case for CHP even stronger***

In addition to the efficiency and intrinsic environmental benefits of using fuel inputs less wastefully, CHP provides other important benefits to Massachusetts. These include, but are not limited to, the following:

- **Electricity Price Mitigation.** Electric power prices are set in auctions run by ISO New England. Prices are likely to increase with the Forward Capacity Market and as aggregate demand increases. Generating power locally helps drive down prices (as well as the need for new transmission) by influencing market clearing prices.
- **Natural Gas Price Mitigation.** CHP has been shown to reduce net natural gas imports to the region. Displacing existing, less-efficient, gas usage conserves natural gas while also displacing gas that would be burned in central station generators, reducing net gas usage. A study that assumed 4,238 MW of new CHP were added in the Northeast region calculated natural gas consumption would fall by 4.2%.<sup>4</sup> Prices would decline by a greater percentage.
- **Reliable Power.** Many businesses, such as those in the financial and telecommunications sectors, have already invested in CHP, in part to help ensure high quality, reliable electrical power during times of grid stress. Many facilities may face similar needs, particularly with respect to emergency preparedness. A decentralized energy system utilizing CHP is intrinsically robust.
- **System Power Needs.** The New England grid faces supply shortages. On-site power such as CHP can help provide a critical margin of reliability for the system.
- **Business Competitiveness.** CHP efficiency gains accrue to the bottom line, enhancing profitability. By reducing energy consumption, lowering energy costs and improving power quality and reliability, CHP can save the economic viability of an otherwise failing firm, and keep business in Massachusetts. In some instances, utilizing renewable or recovered “opportunity fuels” provides additional benefits such as avoiding hauling, carting, disposal or sewerage costs caused by waste products that can be converted to an energy source, in addition to the enhanced GHG reduction.

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<sup>4</sup> Energy and Environmental Analysis, Inc., “Natural Gas Impacts of Increased CHP,” submitted to the U.S. Combined Heat and Power Association, October 2003. Available at: [http://uschpa.admgt.com/CHP\\_GasOct03.pdf](http://uschpa.admgt.com/CHP_GasOct03.pdf)

- **Economic Development.** Distributed energy equipment and components production, engineering, maintenance and project development provide an array of good jobs and business opportunities.

These supplemental benefits of CHP deployment do not necessarily merit formal consideration under RGGI, but should be kept in mind as part of RGGI's goal to attain GHG reductions at lowest cost and with the many other benefits to the Massachusetts economy.

**C. *CHP is a cost effective solution***

Recent studies of California's Small Generator Incentive Program (SGIP),<sup>5</sup> and a comparison of four states' energy development incentives, indicate that promoting CHP is a cost effective way to mitigate GHG emissions, at least compared to the cost of providing incentives to other generation technologies.<sup>6</sup> [See § IV below]

Some reasons for this cost effectiveness include CHP's relatively simple equipment that reduces costs compared to more experimental technologies, its "cross sectoral" offsetting of both electrical and thermal energy loads, and the variety of benefits to end users that may facilitate the leveraging of private capital via relatively small public funds.

Solar power, fuel cells and other emerging energy technologies hold great promise for meeting future energy need in an economical and environmentally sound manner. What distinguishes CHP is its ability to provide marked advances right now in the efficiency of energy use within the state. CHP is a cost-effective solution available today for reducing environmental and climate change impacts of energy use, providing a hedge against volatile fuel prices and slowing the export of energy dollars out-of-state.

**D. *State and regional climate plans recognize CHP's potentially valuable contribution***

Numerous researchers, climate roadmaps, and state climate change plans have recognized CHP as a valuable and cost effective GHG mitigation tool. Some examples are described briefly below.

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<sup>5</sup> Itron, Inc., "CPUC Self-Generation Incentive Program: In-Depth Analysis of Useful Waste Heat Recovery and Performance of Level 3/3N Systems, Final Report," February 2007. Available from: [http://www.itron.com/pages/news\\_articles\\_individual.asp?nID=itr\\_014829.xml](http://www.itron.com/pages/news_articles_individual.asp?nID=itr_014829.xml) or directly at: [http://www.itron.com/asset.asp?path=support/reports/itr\\_014971.pdf](http://www.itron.com/asset.asp?path=support/reports/itr_014971.pdf)

<sup>6</sup> Bourgeois, T. and C. Young, "State Experiences with Financial Incentives to Promote Clean Distributed Energy: Greenhouse Gas Reductions with CHP," In Proceedings of the ACEEE 2007 Summer Study on Energy Efficiency in Industry.

**1) Maine Climate Action Plan**

The Maine Climate Action Plan<sup>7</sup> recognizes policies to promote CHP as the most cost effective strategy of all options studied. The Plan recognizes that CHP's efficiency benefits provide a significant boost to Maine's compliance with the new RGGI mandate, and determines that CHP incentives are the most cost effective of all GHG reduction options that were considered, with a cost of negative \$185 per tonne of saved carbon. The report considered numerous GHG reduction options. The cost effectiveness of CHP incentive policies compares very favorably with other potential measures considered in the Climate Action Plan. ("A Climate Action Plan for Maine 2004," table on p. 15.)

**2) Connecticut Climate Change Action Plan**

The Connecticut Climate Change Action Plan 2005 recommendation number 52, "Energy Efficiency and Combined Heat and Power" recommends "a package of energy efficiency and combined heat and power (CHP) measures" as part of a comprehensive set of recommendations.<sup>8</sup> Although cost and reduction estimates were not valued, the report does state that the CHP policies would have a positive net benefit to the state.

**3) New Jersey Clean Energy Program**

New Jersey's Clean Energy Program provides incentives to a variety of project types, including energy efficiency, renewables, and CHP. The Combined Heat and Power Program Description lists several program goals, specifically including GHG reduction:

- to reduce overall system peak demand;
- to encourage the use of emerging technologies;
- to use energy more efficiently and reduce emissions of greenhouse gases; and
- to use distributed generation to provide reliability solutions for New Jersey. (2006 Program Report, p. 25)

The program explicitly values the GHG reduction contribution of CHP. The latest program report<sup>9</sup> states:

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<sup>7</sup> "A Report to the Joint Standing Committee on Natural Resources of the Maine Legislature Pursuant to PL 2003 Chapter 237," Department of Environmental Protection December 1, 2004. Available at: <http://maineghg.raabassociates.org/finalplan.asp>; accessed 10/2/2006.

See table on p. 15 comparing the cost effectiveness of CHP to other potential measures, and the discussion of CHP (Option #36) p. 75.

<sup>8</sup> Governor's Steering Committee on Climate Change "Connecticut Climate Change Action Plan 2005," January 2005. P. 190. Available at:

[http://www.ctclimatechange.com/documents/Electricity\\_CCCAP\\_2005.pdf](http://www.ctclimatechange.com/documents/Electricity_CCCAP_2005.pdf)

<sup>9</sup> "New Jersey's Clean Energy Program Report submitted to the New Jersey Board of Public Utilities" issued April 9, 2007 and reporting for January 1, 2006 through December 31, 2006. Available at: <http://www.njcleanenergy.com/html/5library/pdf/BPURpt4Q06Final.pdf>

CHP projects also reduce greenhouse gas emissions, since they tend to use cleaner technologies that produce fewer emissions than if the electricity was generated by the grid. (2006 Program Report, p. 7)

**4) Environment Northeast Climate Change Roadmap for New England and Eastern Canada**

The “Energy” chapter of Environment Northeast’s comprehensive investigation of policies and practices that could help our region notes the efficiency benefits of CHP and recommends several policy actions to encourage CHP. The potential is large. The most significant single policy proposal for CHP (a portfolio standard) was projected to offer an estimated reduction of 10 to 15 Million Metric Tons of CO<sub>2</sub>e, only moderately less than an estimated 20 Million Metric Tons of CO<sub>2</sub>e that could result from Renewable Targets and RPS.<sup>10</sup>

***E. Existing pollutant trading schemes, such as for NOx Emission Reduction Credits and Allowances, recognize the value of CHP***

CHP applications may apply for and receive Emission Reduction Credits (ERCs) that can be used for new and/or expansion projects that require criteria pollutant emission offsets. States are beginning to recognize the potential for smaller-scale CHP in certain applications, (e.g. high efficiency/low emissions CHP replacing aged, inefficient and dirty number 4 or number 6 oil boilers at a site) to serve as a new source of ERCs.

In addition, Emission Allowance programs in MA, CT, and NY all permit the participation of CHP as a part of their Public Benefit Set-Aside (PBSA) allotments in the State NOx Budget Trading programs. New York State and Connecticut have created set-aside allotments for energy efficiency and renewable energy and have included CHP in the definition of eligible technologies and applications. Massachusetts has created a 5% PBSA for energy efficiency and renewable energy that explicitly includes CHP applications. For example please see “Instructions for PBSA NOx Allowances Application” at <http://www.mass.gov/dep/air/approvals/aq26.pdf>

In September 1998 the US EPA issued a final rule for addressing NOx emissions reductions in a 22 state region in the Eastern U.S. The rule, which is commonly referred to as the NOx State Implementation Plan (SIP) Call, required the development of NOx budgets and mechanisms for allocating these budgets to affected units in each of the states. As part of the program, and as a means of reducing the cost burden of implementing the program, the EPA encouraged the creation of set-asides for renewable energy, energy efficiency and CHP applications that met and exceeded high efficiency, low emissions standards.

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<sup>10</sup> Stoddard, Michael D. and Derek Murrow, Environment Northeast, “Climate Change Roadmap for New England and Eastern Canada” 2006. 240 pages. See pp. 108 – 111 for general discussion, and p. 130 for summary estimate. Available at: <http://environmentnortheast.org/Publications/ENE%20Climate%20Roadmap/Climate%20Change%20Roadmap%20Energy%20Chapter.pdf>. Accessed 13 September 2007

State and federal air regulators have recognized that there is a place of CHP applications in market based emission trading programs. High efficiency low emissions CHP has been recognized as a viable means of meeting criteria pollutant emissions reductions targets. States are carrying forward this precedent as they finalize their CAIR (Clean Air Interstate Rule) protocols and procedures.

Massachusetts took a leadership role among the states in creating a 5% Public Benefit Set-Aside, with specific inclusion of CHP applications. In the same manner, we encourage Massachusetts to consider high efficiency, low emission CHP applications as an eligible measure for assisting the State in meeting RGGI goals and objectives in a cost-effective manner

### **III. CHP Is Already Providing Important Benefits to Massachusetts, and Can Provide Even More**

#### **A. *Existing CHP in Massachusetts provides benefits now***

Massachusetts has a positive and enviable history of industrial CHP utilization, which has already provided significant economic opportunities and jobs. A database of CHP projects kept by EEA<sup>11</sup> lists over 1,880 MW of CHP capacity in Massachusetts.

CHP has provided Massachusetts with economic growth, jobs, clean reliable power, and significant environmental benefits. Given the many advantages of CHP, the large additional potential for heat recovery in the state should be fully harnessed as soon as practicable. The Commonwealth's implementation of RGGI offers an opportunity to solidify support for CHP and to help ensure that CHP provides the greatest possible benefits.

#### **B. *CHP opportunities in Massachusetts should be utilized to provide future benefits***

A 2006 study of CHP potential in Massachusetts<sup>12</sup> determined that the technical potential for CHP is greater than 4,700 MW at 18,500 sites throughout the state. Although a substantial portion of this opportunity is financially attractive for building owners to install, we must do more to ensure that these benefits are realized. CHP systems can be economically attractive for many building types.<sup>13</sup> Commercial buildings, college

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<sup>11</sup> Energy and Environmental Analysis, Inc., an ICF International Company. Available at: <http://www.eea-inc.com/chpdata/States/MA.html>

<sup>12</sup> Lauren Mattison, "Technical Analysis of the Potential for Combined Heat and Power in Massachusetts" (University of Massachusetts Amherst, Center for Energy Efficiency and Renewable Energy, May 2006). Available at: '[http://northeastchp.org/uploads/Lauren\\_Mattison - Potential for CHP in Massachusetts.pdf](http://northeastchp.org/uploads/Lauren_Mattison_-_Potential_for_CHP_in_Massachusetts.pdf)'

<sup>13</sup> This is similar to demand-side energy efficiency, where many economically viable energy efficiency opportunities are not exploited due to a variety of market barriers.

campuses, hospital complexes, and government facilities are good candidates for integrated CHP systems. Of these, the largest number of opportunities will be found in commercial and institutional buildings, particularly office buildings, in the relatively small size range of 50 to 500 kWe units. CHP providers and developers will make more investments in such projects, and create more construction/installation jobs in Massachusetts, if RGGI provides incentives that improve the payback periods for CHP projects, and if RGGI sends a message to the markets (and to the state's electric utilities) that CHP will be an economic and environmental priority.

**C. *CHP needs support to overcome barriers and provide benefits***

Despite the advantages of CHP and the fact that it can be and frequently is a cost effective energy option, numerous barriers, both subtle and specific, restrict its rapid and complete adoption. It is most definitely *not* safe to assume that just because CHP makes sense, it will quickly disseminate through the economy. To achieve the technical potential identified above will require concerted action among numerous state agencies and departments. For example, the Massachusetts Technology Collaborative has been diligently working to solve some of the technical, policy and economic barriers to CHP, including a significant stakeholder collaboration effort and engineering investigations, but its work is ongoing and likely will ultimately result in recommendations for further state action rather than in completed solutions *per se*. Further efforts will almost certainly still be needed.

One of the significant features of CHP is that it provides numerous kinds of value, including the environmental, economic, reliability, and system benefits discussed above. However, very few of these benefits accrue to the project itself. In order to maximize the public benefits of CHP projects, they should receive at least a portion of each type of value that they provide, including reasonable credit for their GHG mitigation achievements.

**IV. CHP Merits Strong Support from the Auction Revenues Fund**

The NECHPI is aware of and appreciates the stated commitment from Bay State officials to use the CO<sub>2</sub> allowance auction revenues to support public benefit projects such as a new energy-efficiency and peak-management initiative that will include energy efficiency, demand reduction, renewable energy programs, and CHP projects. The stated intention to maximize rate reduction, support the entire electricity system, improve the overall electricity market and lower electric bills for consumers by managing peak electricity demand is laudable.

To maximize the potential value of CHP in this effort, CHP should be integrated into the implementing agency's thinking and planning. CHP works best when it is incorporated into a program design that includes building efficiency improvements and other upgrades, to minimize overall assessment, planning, procurement and construction costs. In the long run isolating CHP as a separated program area reduces its effectiveness, causes duplicated auditing and assessment efforts, and increases overall costs.

CHP has been demonstrated to be a cost effective strategy to accomplish the stated goals of the auction revenues funding. An assessment of California's Small Generator Incentive

Program by Itron Inc.<sup>14</sup> shows that CHP incentives can provide a greater reduction of CO<sub>2</sub> per dollar than incentives aimed at other technologies. Although the CO<sub>2</sub>e benefit per megawatt is lower for CHP than for renewable generation technologies, the CO<sub>2</sub>e per dollar spent is generally greater. A comparison of four states' energy development incentives based on the same assessment methodology indicates that promoting CHP generally is a cost effective way to mitigate GHG emissions, compared to the cost of providing incentives to other generation technologies.<sup>15</sup> Considering the goals of the fund will be to mitigate GHG emissions and provide other benefits to Massachusetts, full integration of and support for CHP is well justified.

## **V. Massachusetts Should Actively Promote CHP as an Offset Category to Recognize its Thermal Improvements and GHG Reductions**

The “next steps” for RGGI implementation call for, among other tasks, offsets implementation, development of additional offset standards, specific offset evaluation tools and ongoing offsets market evaluation. We urge the DEP and DOER to propose rules in this process that will allow at least some portion of a CHP project's GHG reduction beyond a site's baseline emissions to receive RGGI offset credits.

NECHPI recognizes the important goal of not creating allowances for projects that would be completed in the ordinary course of business, or in other words that are not “additional.” We also recognize the need to minimize the administrative burden of RGGI implementation and to avoid complicated compliance procedures or criteria that require individual judgments to verify. Neither the climate nor the CHP industry would benefit from a burdensome process that falsely certified “paper gains” instead of genuine GHG reductions.<sup>16</sup>

### **A. *Potential new offsets should recognize thermal improvements, be strictly verifiable, and not favour chosen technologies over mitigation results***

One possible way to recognize the GHG mitigation value of CHP would be to focus any credit the thermal efficiency of CHP, such as the offset boiler emissions of a project, perhaps beyond an established and rising efficiency level keyed to the best commercially installed systems in a given size or market category.<sup>17</sup> Other options include a credit for avoided line losses and other comparative benefits of CHP compared to existing central

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<sup>14</sup> Itron, *supra*. Available at: [http://www.itron.com/asset.asp?path=support/reports/itr\\_014971.pdf](http://www.itron.com/asset.asp?path=support/reports/itr_014971.pdf)

<sup>15</sup> Bourgeois, T., *supra*.

<sup>16</sup> We agree with the preamble to the offsets discussion in the Model Rule that states CO<sub>2</sub> offset allowances should “represent CO<sub>2</sub> equivalent emission reductions or carbon sequestration that are real, additional, verifiable, enforceable, and permanent within the framework of a standards-based approach.”

<sup>17</sup> This proposal would be particularly important if our assumption about the intended scope of the prohibition against offset projects that incorporate electrical generation is not correct. See following section.

station facilities, fully accounting for the total on-site efficiency improvements of a CHP system (beyond those due to ancillary fossil fuel efficiency improvements associated with a comprehensive efficiency upgrade), or allowing a portion of CHP generation to be included among the voluntary green power purchases for which some CO<sub>2</sub> credits will be retired.

NECHPI agrees that clear, strict standards are necessary for any offset category to perform its intended function, and would support efforts to fashion rules that are rigorous and unambiguous. Any new offset category should be vetted with the same care as the existing ones. To this purpose, any new evaluation criteria should be performance based and technologically neutral, not favoring any particular technological “means” over the carbon reduction “end.”

***B. Discrete benefit streams may merit targeted support***

The model rule prohibits offset credits from flowing to projects that receive other state support, and the proposed rules follow that example. We recognized the need for a clear identification of projects that would be built anyway, without RGGI benefits. The blanket prohibition is an effective rule of thumb. However, we urge careful consideration of the diverse ways that CHP can help reduce CO<sub>2</sub> emissions separate from other types of benefits that it may provide, and recognition that not all payments that may appear to be “public support” are actually public. Each benefit should be counted individually. For example, future payments from utilities and authorized by the Department of Public Utilities in consideration for a CHP installation’s grid support or ability to forestall substation improvements should not automatically preclude credits flowing for thermal improvements that mitigate GHGs.

**VI. Clarifications to the Proposed Rule**

***A. The DEP should clarify that thermal upgrades at existing buildings are not precluded from qualifying for offsets solely because a CHP generator is installed as an additional phase of an end use efficiency project***

The most effective and sensible way to implement CHP in existing buildings is to perform a comprehensive efficiency upgrade first, and then, if coincident thermal and electric loads remain, assess the option of installing CHP to serve them. Such a comprehensive approach maximizes environmental benefits in two ways. First, it is sensible to reduce loads before meeting them with production. Second, it can allow financing to be bundled, perhaps via a performance contractor, by blending short payback efficiency upgrades to help finance relatively slower return investments such as the capital costs of new windows, or CHP equipment.

From some perspectives a suite of improvements that includes both end use efficiency improvements (such as in heating distribution system upgrades) and a CHP system that generates electricity may be considered one project. However, in reality they are two distinct sets of efficiency improvements that are coordinated to maximize overall benefits.

With respect to the fourth proposed offset category (“reduction or avoidance of CO<sub>2</sub> emissions from natural gas, oil, or propane end-use combustion due to end-use energy efficiency”) the proposed rule does not adequately clarify that the existence of a CHP prime mover may be ignored when crediting end use thermal energy conservation measures (ECMs). The potential implementation of end use ECMs, such as the proper sizing and commissioning of heating systems, energy management systems, and measures that improve the thermal performance of the building envelope, etc., should not be compromised due to uncertainty about whether installing on-site generation as an additional part of the improvement package would disqualify them from receiving offsets. If an energy consultant recommends significant HVAC upgrades that would otherwise qualify as an offset, it would be very unreasonable disallow them solely because on-site CHP generation were installed under the same performance contract.

The rules do not seem clear on this point. In § (10) 4 [General additionality requirements], subpart b states:

CO<sub>2</sub> offset allowances shall not be awarded to an offset project that includes an electric generation component, unless the project sponsor transfers to the Department or its agent legal rights to any and all attribute credits (other than the CO<sub>2</sub> offset allowances that would be awarded under 310 CMR 7.70(10)(g)) generated from the operation of the offset project that may be used for compliance with a renewable portfolio standard or other regulatory requirement

Depending on the reader, this subsection seems to preclude credit for any project that has associated CHP. However, the definition of “offset project”: at 310 CMR 7.70(1)(b) states;

An offset project includes all equipment, materials, items, or actions directly related to the reduction of CO<sub>2</sub> equivalent emissions or the sequestration of carbon specified in a consistency application.... Equipment, materials, items, or actions unrelated to an offset project reduction of CO<sub>2</sub> equivalent emissions or the sequestration of carbon, but occurring at a location where an offset project occurs, shall not be considered part of an offset project, unless specified at 310 CMR 7.70(10)(e).

Assuming that the proposed rules presume on-site generation is unrelated to measures in this offset category, then this definition seems to allow the crediting of the non-generating efficiency ECMs—by definition the generation would not be part of the “project.” We believe that something like this is what the rules intend, and that thermal usage improvements can qualify for offset credits regardless of the chance existence of CHP. Language should be added to clarify this intent.

Clarification in this manner would neither support nor impede the possibility of a future new offset category that credits the efficiency of the CHP prime mover, generator and heat recovery system.<sup>18</sup> As long as the electrical generation component of a suite of efficiency improvements is not included in the carbon mitigation calculation, the proposed exclusion of electric generation at (10), 4, subpart b would not be violated. The proposed rules already contemplate this sort of calculation, at § 4. e. subpart ii “isolation of applicable energy conservation measure.” This subpart calls for separately calculating the impact of ECMs or accounting for interactions among them, as appropriate.<sup>19</sup> As long as the seven ECMs listed in 4 a i are appropriately verified, the apparent intent of the proposed rule would remain preserved and we can leave for another day the complex questions of how to accurately account for the improved on-site generation efficiencies.

***B. The definition of “Market Penetration” should clearly authorize consideration of varying sub-sectors within the same market.***

The proposed definition of “Market penetration rate” at should be clarified to explicitly allow the DEP to consider specific segments of a market, in the event that the language allowing “the Department [to] determine an appropriate market definition” does not already contemplate such authority.<sup>20</sup> Certain types of efficiency measures have been more readily adopted by industrial than commercial customers, for example, or by specific industries or customer sizes. Thus, separate analyses may be appropriate for industrial, commercial and residential applications of a given ECM type.

It is difficult to know a “potential” market size, particularly considering the nascent availability of new technologies such as micro CHP, novel chillers, or innovative new strategies to offset boiler emissions. As just one example, separate market analysis of thermal chilling by customer type may be appropriate, and particularly justified, considering the large peak electric impacts

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<sup>18</sup> As argued above in §V, NECHPI does advocate the eventual creation of an offset that calculates CHP benefits in their entirety, but this proposed clarification is not intended to create any new offset. Here our intention is simply to promote better thermal efficiency design and implementation, without inadvertently creating a perverse incentive that unintentionally discourages CHP.

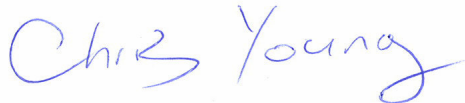
<sup>19</sup> The text reads: In calculating both baseline energy usage and energy savings, the applicant shall isolate the impact of each eligible energy conservation measure (ECM), either through direct metering or energy simulation modeling. For offset projects with multiple ECMs, and where individual ECMs can affect the performance of others, the sum of energy savings due to individual ECMs shall be adjusted to account for the interaction of ECMs.

<sup>20</sup> Definition in 7.70: Massachusetts CO<sub>2</sub> Budget Trading Program (10). “Market penetration rate. A measure of the diffusion of a technology, product, or practice in a defined market, as represented by the percentage of annual sales for a product or practice, or as a percentage of the existing installed stock for a product or category of products, or as the percentage of existing installed stock that utilizes a practice. The Department may determine an appropriate market definition and market penetration metric for a category of technology, product or practice, and may issue guidance specifying the technologies, products or practices that meet a specified market penetration rate.”

## **VII. Summary of Recommendations and Conclusion**

Considering the significant potential value of CHP in helping Massachusetts successfully implement its RGGI goals, NECHPI urges both the DEP and DOER to keep in mind the many cost effective benefits CHP can offer. CHP requires greater policy support to allow private investors to capture some share of the public benefits they provide. In particular with respect to the potential for GHG mitigation we urge full inclusion of CHP in the programs funded through the auction revenues, strong support for fair and accurate inclusion of CHP as a future offset category, and specific attention to thermal efficiency so that the proposed rules encourage greater realization of this category of mitigation.

On behalf of the Northeast CHP Initiative  
and its Executive Committee,



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