

*Creating A Greener Energy Future For the Commonwealth*



**EPA Combined Heat and Power  
Partnership Webinar**

**Biomass CHP Applications**

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# **Biomass CHP in Massachusetts RPS and APS**

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# Outline

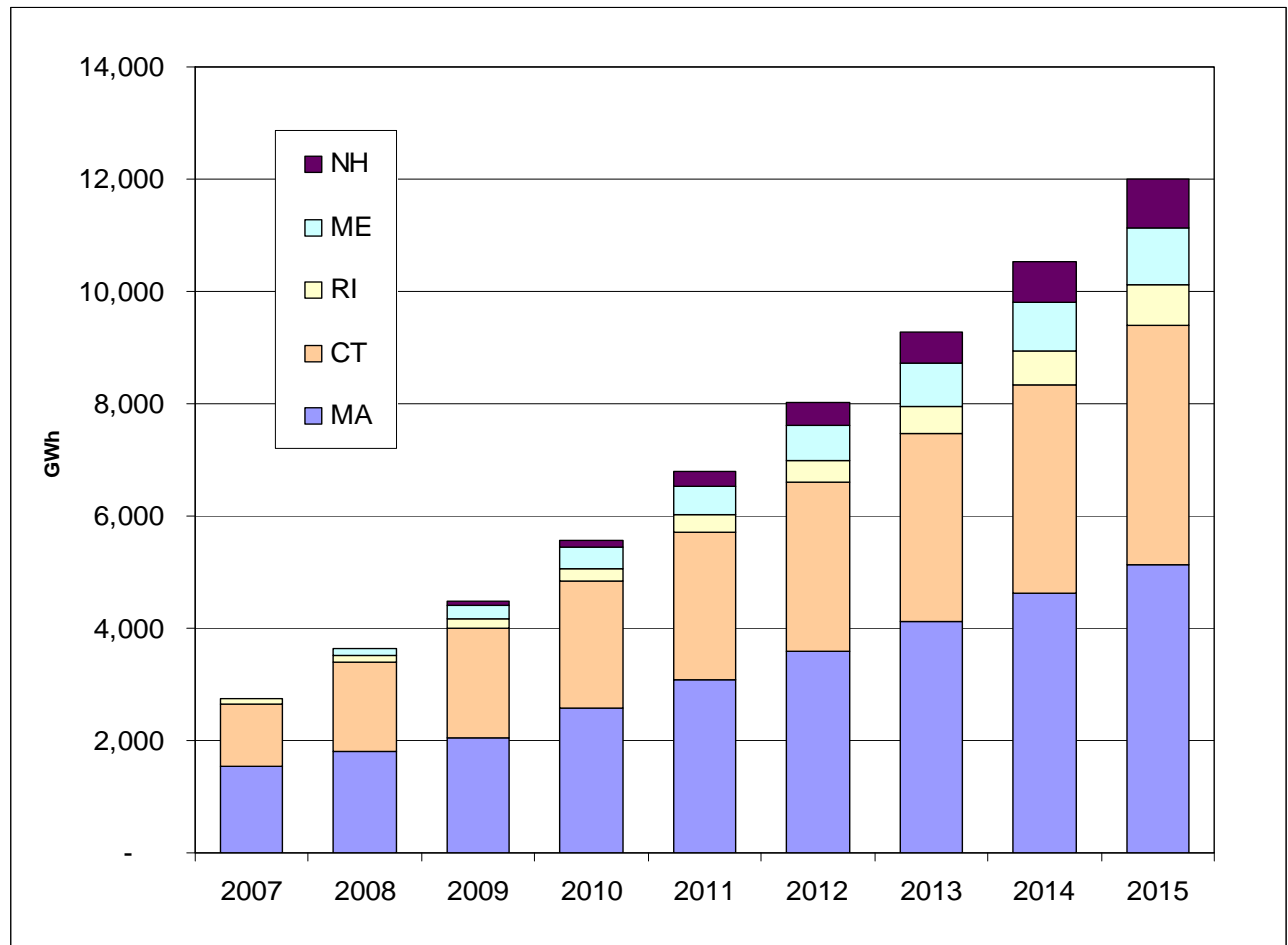
- MA RPS Background
  - RPS Briefing
  - Biomass eligibility
  - CHP eligibility
  - Projects
- New Incentives
  - Expansion of Behind-the-Meter eligibility
  - New Alternative Energy Portfolio Standard (APS)
  - Compound CHP eligibility: electrical and thermal
  - New projects

# New England Renewable Portfolio Standards (RPS)

wealth

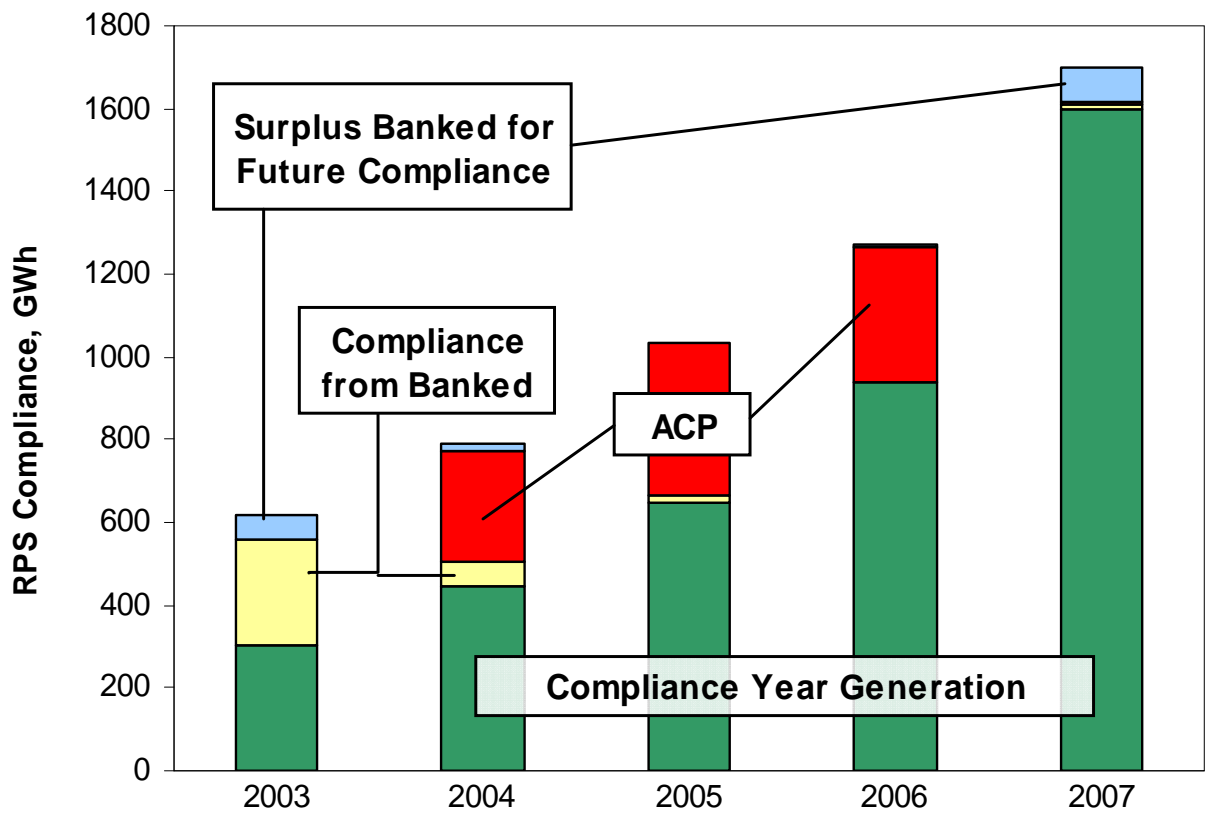
**Small but increasing portion of all retail electricity must come from qualified, new, renewable energy.**

**MA RPS Class I rate = 4% in 2009, rises 1% yearly, → 15% in 2020, continues rising.**



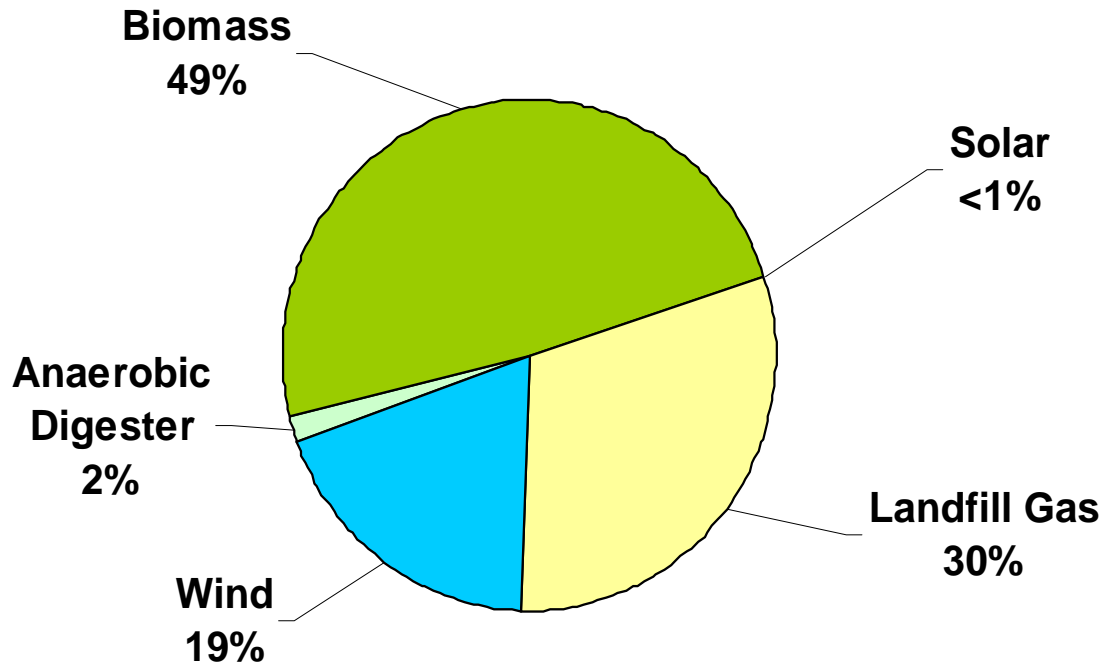
**MA RPS  
Compliance**

**Historical  
Trends**

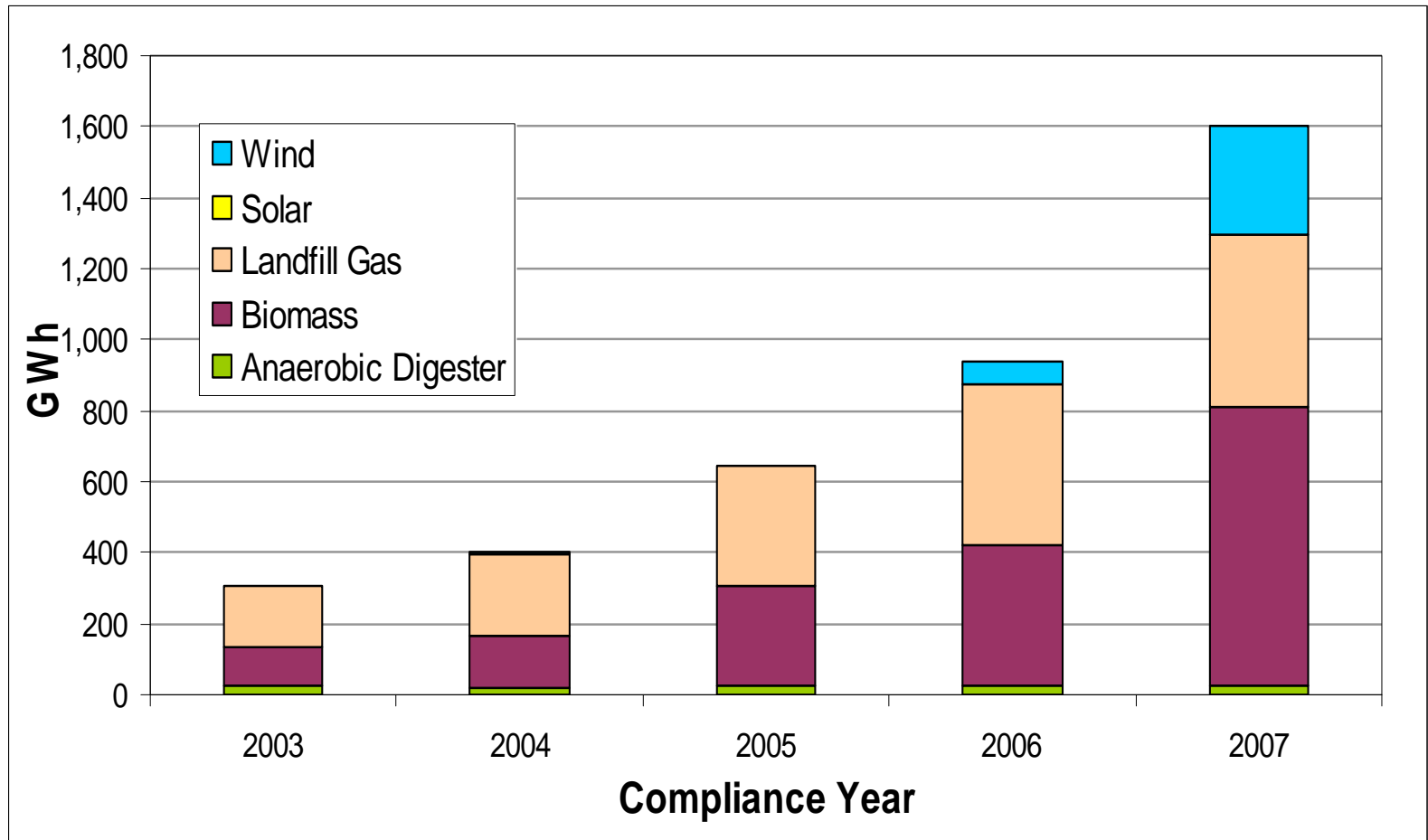


	2003	2004	2005	2006	2007
Surplus Banked	61	20	1	9	81
ACP Compliance	0	265	368	323	11
Compliance from Banked	255	61	20	2	7
Compliance Year Generation	304	445	645	939	1600

# MA RPS 2007 Compliance by Type

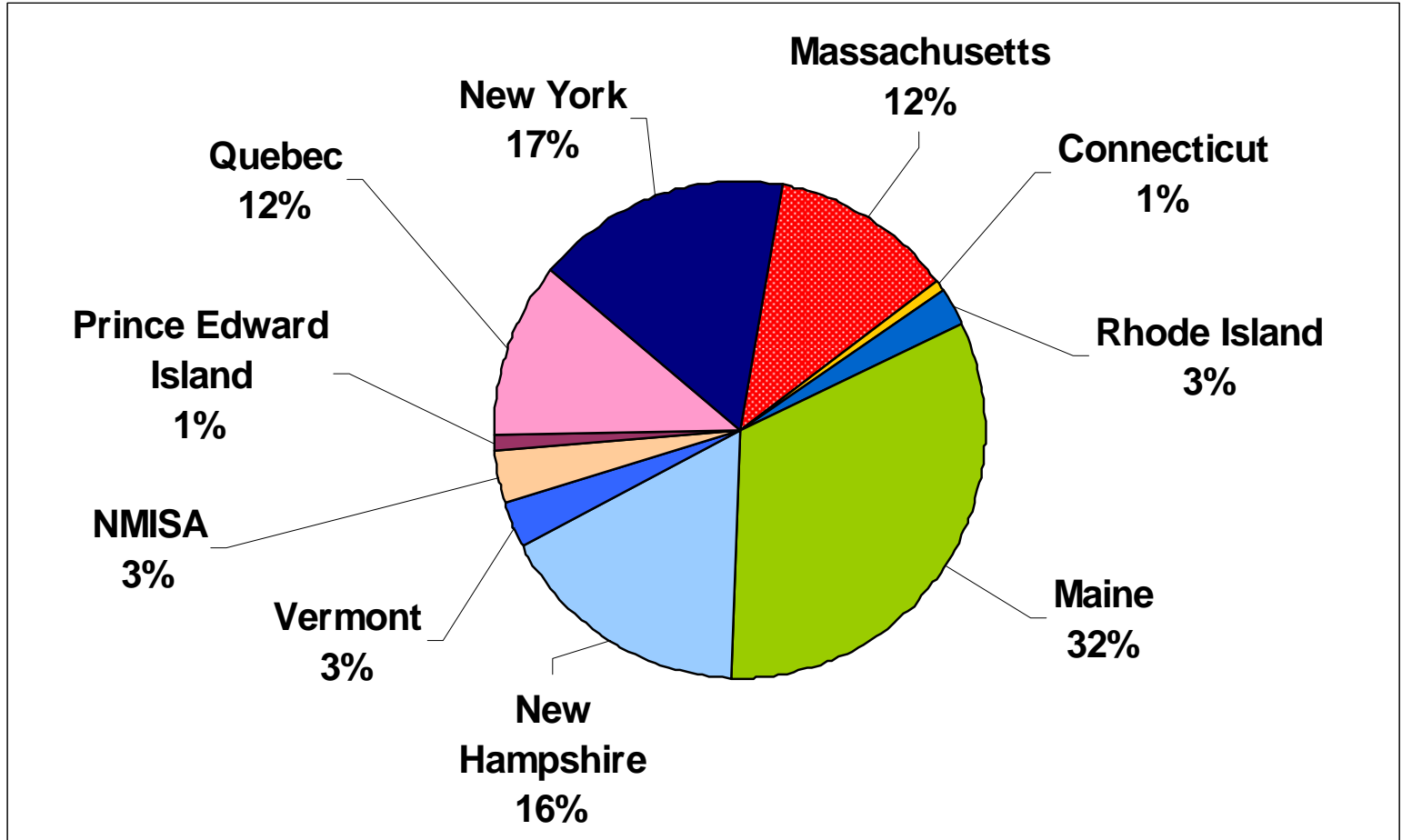


# MA RPS Compliance by Type, 2003-2007



# MA RPS

## 2007 Compliance by Generator Location



# MA RPS Biomass Eligibility

## Eligible Biomass Fuels (paraphrased!)

- Wood chips & clean forestry waste, not mixed w/ other unsorted solid wastes
- Crops & by-products/waste from agriculture, food processing, & food service
- Algae
- Organic refuse-derived fuel (not defined)
- Anaerobic digester gas & other biogases from the above resources
- “Neat Eligible Liquid Biofuel” (defined term) derived from above resources

## Low Emissions

- Standards developed in collaboration with MA Dep’t of Enviro. Protection
- Guidelines list NOx and PM limits only for solid-fueled steam boilers
- Emissions for other types of facilities to be developed as needed

## “Advanced Biomass Power Conversion Technologies”

- Individual project evaluation and precedent
- No technology categorically excluded
- Generally: current technologies, high efficiency, clean
- So far: fluidized beds, close-coupled gasifiers, anaerobic digesters, advanced stokers, and two small CHP units

# MA RPS

## CHP Eligibility – then and now

### Pre-2009

- No explicit CHP listing in pre-2009 RPS
- Behind-the-Meter units OK in-state only
- Two CHP units qualified – so far only biomass:
  - 2005: small (45 kW) biodiesel-fired ICE
  - 2008: small (500 kW) wood-fired steam boiler, back pressure turbine

### 2009 onward: big changes

- New incentives in RPS statute
- Statute mandates CHP in new portfolio standard

# MA RPS and APS Biomass CHP Eligibility Today

## MA Green Communities Act of 2008

- RPS became RPS Class I (& Class II added)
- Behind-the-Meter generation qualifies for RPS *anywhere* in New England, **but** with independent, 3<sup>rd</sup> party meter readers
- New “Alternative Energy Portfolio Standard” includes CHP – most “shovel ready” of APS technologies
- APS requirements for MA retail electricity suppliers
  - 1% in 2009 (only contracts new/extended 1/1/09-on)
  - Rises by ½ % per year through 2014 (3.5%)
  - Rises by ¼ % per year through 2020 (5%) and beyond

# MA APS CHP Qualification

## Per 225 CMR 16.05(1)(a)2

- Thermal load must be in Massachusetts
- Commercial operation date on/after 1/1/08
- Formula for APS qualified certificates provides incentives for overall CHP system efficiency
- Formula credits both electrical and useful thermal output
- Conversion to CHP or expansion of thermal &/or electrical output, on/after 1/1/08, also eligible
- ♣ Metering/Reporting by an Independent, 3<sup>rd</sup> Party Meter Reader, who inputs data at NEPOOL GIS

# MA RPS vs APS

## Biomass CHP Eligibility Differences

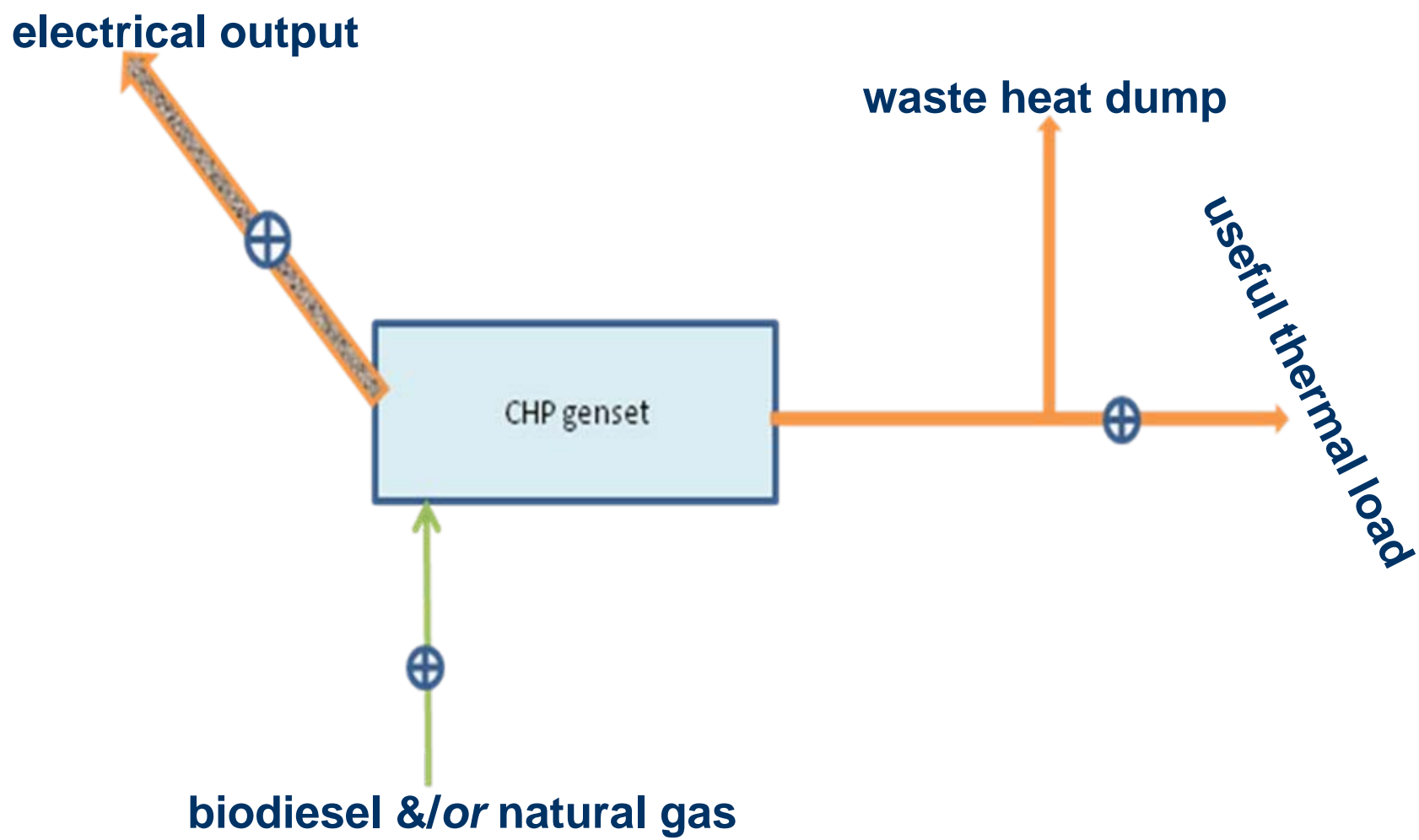
- **RPS** qualifies electrical output only.
  - **APS** CHP formula for qualified output considers both electrical and useful thermal.
  - **RPS** qualifies Behind-the-Meter generation throughout New England (except far northern Maine).
  - **APS** qualifies CHP only if thermal output delivered to MA load
  - **RPS** qualifies CHP generation only from qualified fuels (i.e., eligible biomass and landfill methane gas).
  - **APS** qualifies CHP using **any fuel except** for petroleum, petroleum coke, coal, and nuclear.
  - **RPS** qualifies CHP if new or incremental on/after 1/1/98.
  - **APS** qualifies CHP if new or incremental on/after 1/1/08.
- **Some CHP units can qualify for both RPS & APS, some for only one or the other!**

# MA APS CHP Qualification

## Principles

- Provide incentive for incremental benefit of CHP vs. stand-alone use of separate sources of electrical and thermal energy.
- Quantity of APS-qualified certificates (“AECs”) are based on metered energy flows (on a quarterly basis).
- Thermal energy metered only *at the loads*.
- All energy units are converted to MWHs for credit at NEPOOL-GIS.

# MA APS CHP Output Metering Example



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# MA APS CHP Qualification Formula

**Electric Generation divided by 0.33\***

*PLUS the*

**Useful Thermal Energy divided by 0.8\*\***

*MINUS the*

**Energy Content of the Input Fuel**

*or*

$$\# \text{ AECs} = (\text{MWh elec}/0.33) + (\text{MWh thermal}) - \text{MWh CHP Fuel}$$

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\* **0.33** = overall efficiency of electricity delivered to end-use from grid

\*\* **0.8** = overall efficiency of thermal energy delivered to end-use  
from stand-alone heating unit

N.B.: Thermal Energy measured **AT** the end-use(s)

# MA APS CHP Qualification Formula for CHP conversions or incremental electrical &/or thermal output

***Incremental Electric Generation* divided by 0.33  
*PLUS the*  
*Incremental Useful Thermal Energy* divided by 0.8  
*MINUS the*  
*Energy Content of the Incremental Input Fuel***

# Other MA Biomass CHP Activities

- **Installed Projects**
  - Mount Wachusett Community College
  - DCR Quabbin HQ/Visitors Center
  - Cooley-Dickenson Hospital
  - Brockton Correctional Facility
  
- **Leading-by-Example – State Facilities**
  - Biomass Thermal/CHP Feasibility/Development Projects
    - Springfield Tech Community College
    - UMass Dartmouth and UMass Amherst
    - MA State Police Academy
    - DCR Visitor Centers
  
- **Support for Community Scale Biomass CHP is strong**
  - Public seeks leadership from state to address policy needs

# Questions / Comments ??

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## RPS & APS Regulations

- At DOER homepage, [www.mass.gov/doer](http://www.mass.gov/doer), select Renewable Portfolio Standard at left.
- At RPS page, select Green Communities.
- At Green Communities page, scroll down and select [Emergency Regulations and Rulemaking for RPS Class I, RPS Class II, and APS.](#)
- Watch for final Regulations this spring.