

Emissions Inventory Update

OTC Stakeholder Briefing

April 10, 2014

Susan Wierman & Julie McDill

MARAMA

Key Points

- Current work uses OTC's 2007 platform.
- OTC is moving from base year 2007 to base year 2011 with as much reliance on EPA inventory as possible.
- OTC 2011 platform likely available by late fall 2014.
- OTC plans to use ERTAC tool for forecasting EGU emissions to substitute for EPA forecasts.
- Preliminary analysis of ERTAC results is underway.
- States have provided comments on EPA's 2011 version 1 inventory. Version 2 expected in late 2014.

Regional Inventory Sector Data Sources

EGU – 2011 data from EPA CAMD. ERTAC EGU
for future years

All Else – USEPA modeling 2011 & 2018 platform

Will also need to develop a 2028 platform for
regional haze planning

Topics

- What is ERTAC EGU forecasting tool?
- Examples using the tool
- Comments on EPA's Version 1 2011 inventory
- Schedule for future improvements

Eastern Regional Technical Advisory Committee (ERTAC)

ERTAC convenes ad-hoc groups to solve specific inventory problems

Collaboration:

- States - NE, Mid-Atlantic, Southern, and Lake Michigan
- Multi-jurisdictional organizations
- Industry

ERTAC EGU growth committee convened in 2010

Goal: Build a low cost, stable/stiff, fast, and transparent model to project future EGU emissions

Utility representatives provided guidance on model design and inputs

- AEP – Dave Long
- AMEREN - Ken Anderson
- RRI – John Shimshock
- NY Energy – Roger Caiz

ERTAC EGU Leadership

Current Active Leadership Team

Julie McDill, MARAMA
Mark Janssen, LADCO
Wendy Jacobs, CT
Bob Lopez, WI
Danny Wong, NJ
Joseph Jakuta, OTC

John Hornback, SESARM
John Welch, IN
Jin-Sheng Lin, VA
Doris McLeod, VA
Byeong Kim, GA

Subcommittees

Implementation - Create logic for software

Growth - Regional specific growth rates for peak & off peak

Data Tracking - Improve default data to reflect state inputs

How does it work?

Starting point: Base Year Hourly CEM data by region

2007 and 2011 CEM data developed as base years by ERTAC team

States provide info: new units, controls & other changes

Regional growth rates

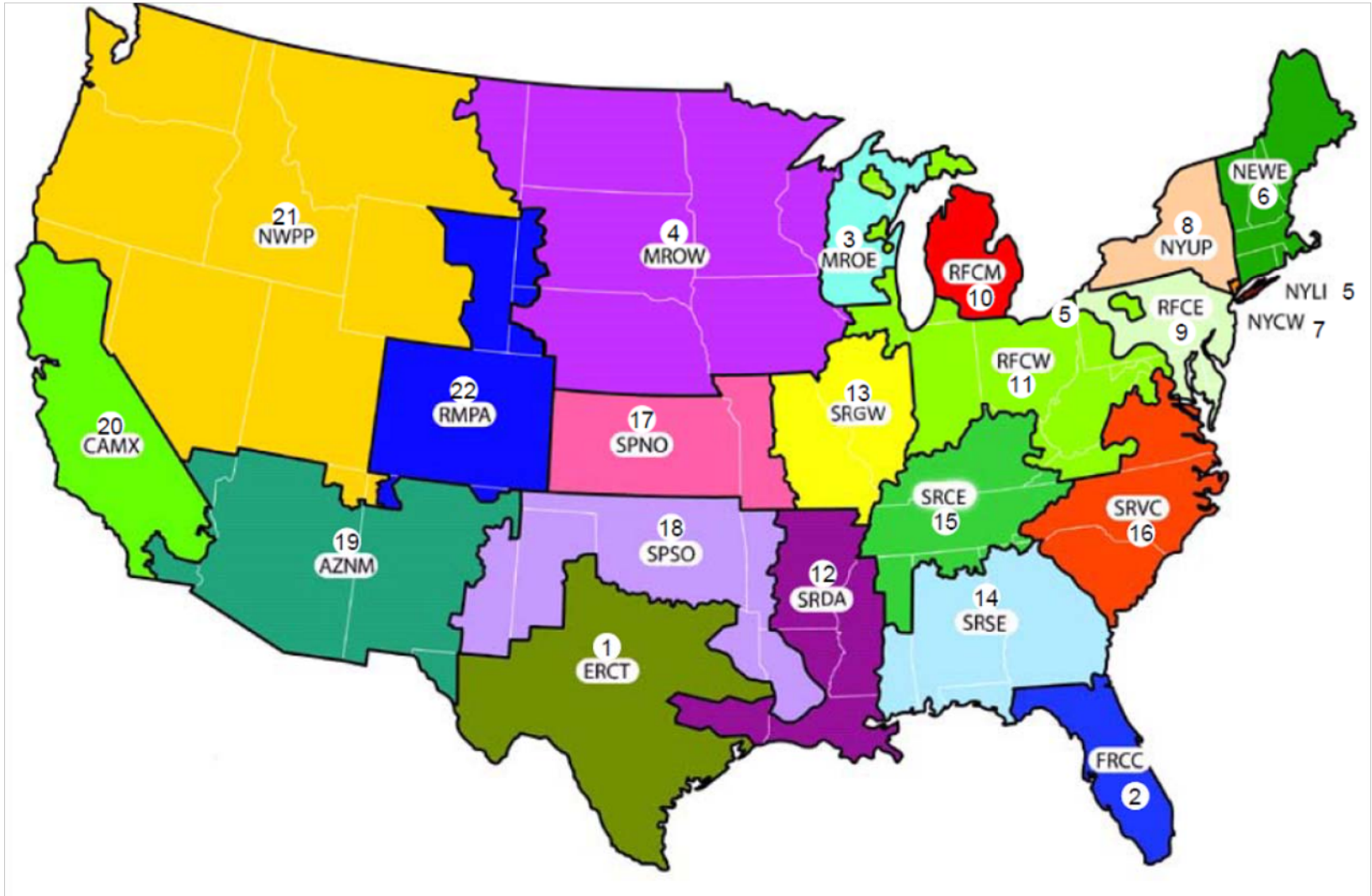
Base – Department of Energy (EIA) Annual Energy Outlook (AEO)

Peak – North American Electric Reliability Corporation (NERC)

Future hourly estimates based on base year activity

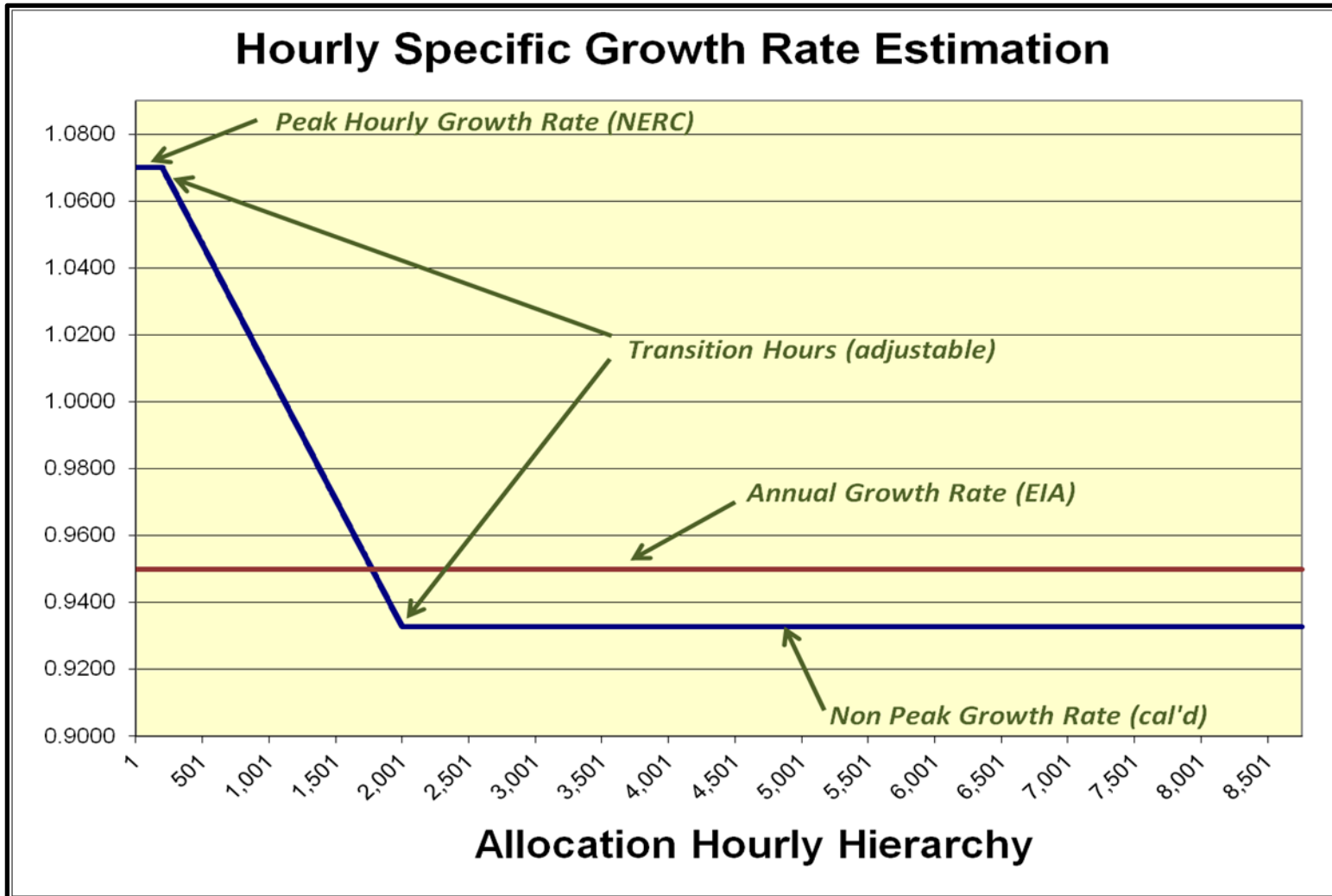
Temporal profile matches meteorology

ERTAC Region Map

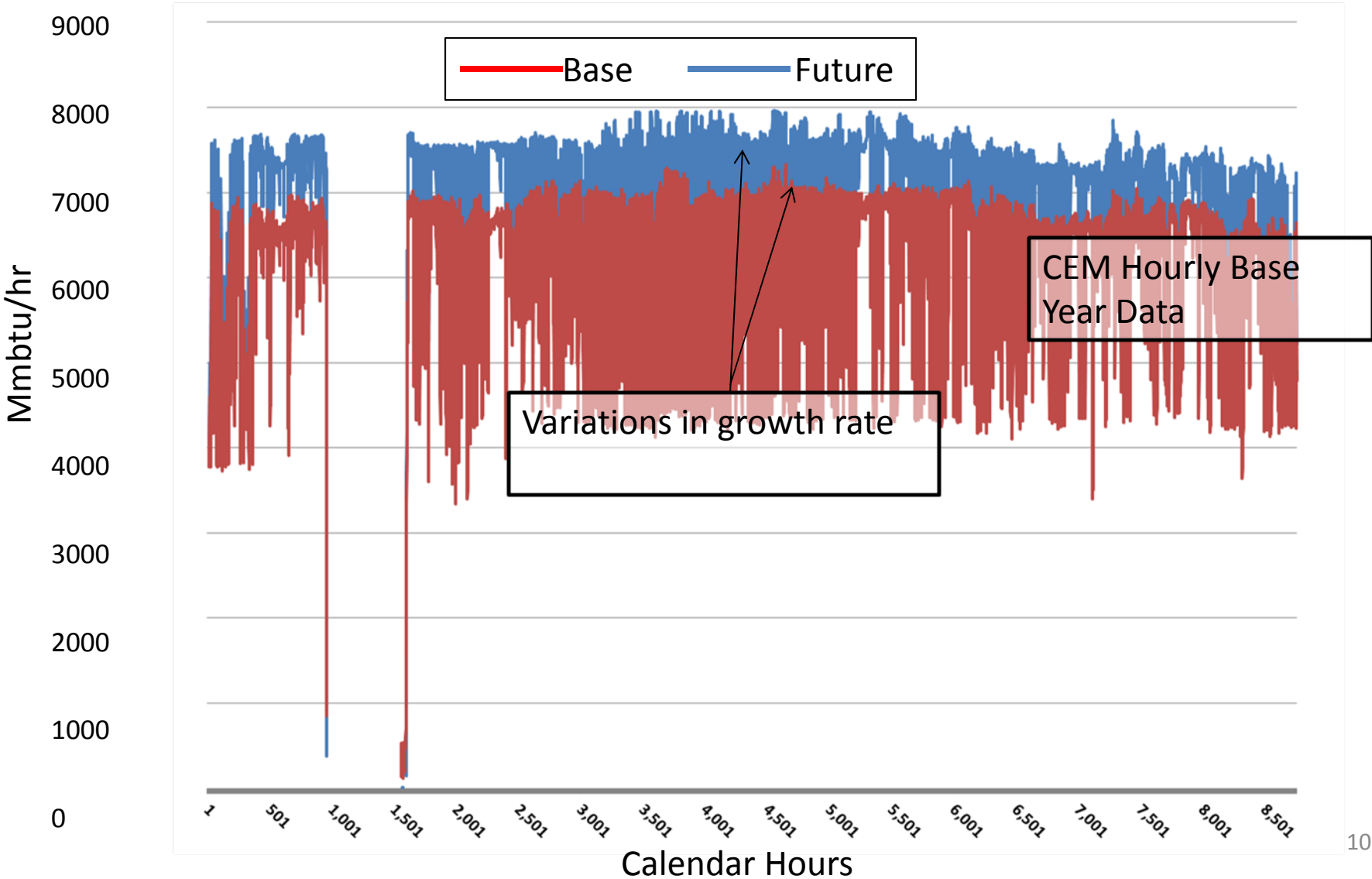


Growth Rates (GR)

- Peak GR = 1.07
- Annual GR = 0.95
- Transition hours of 200 & 2,000
- Non Peak GR = 0.9328 (calculated)

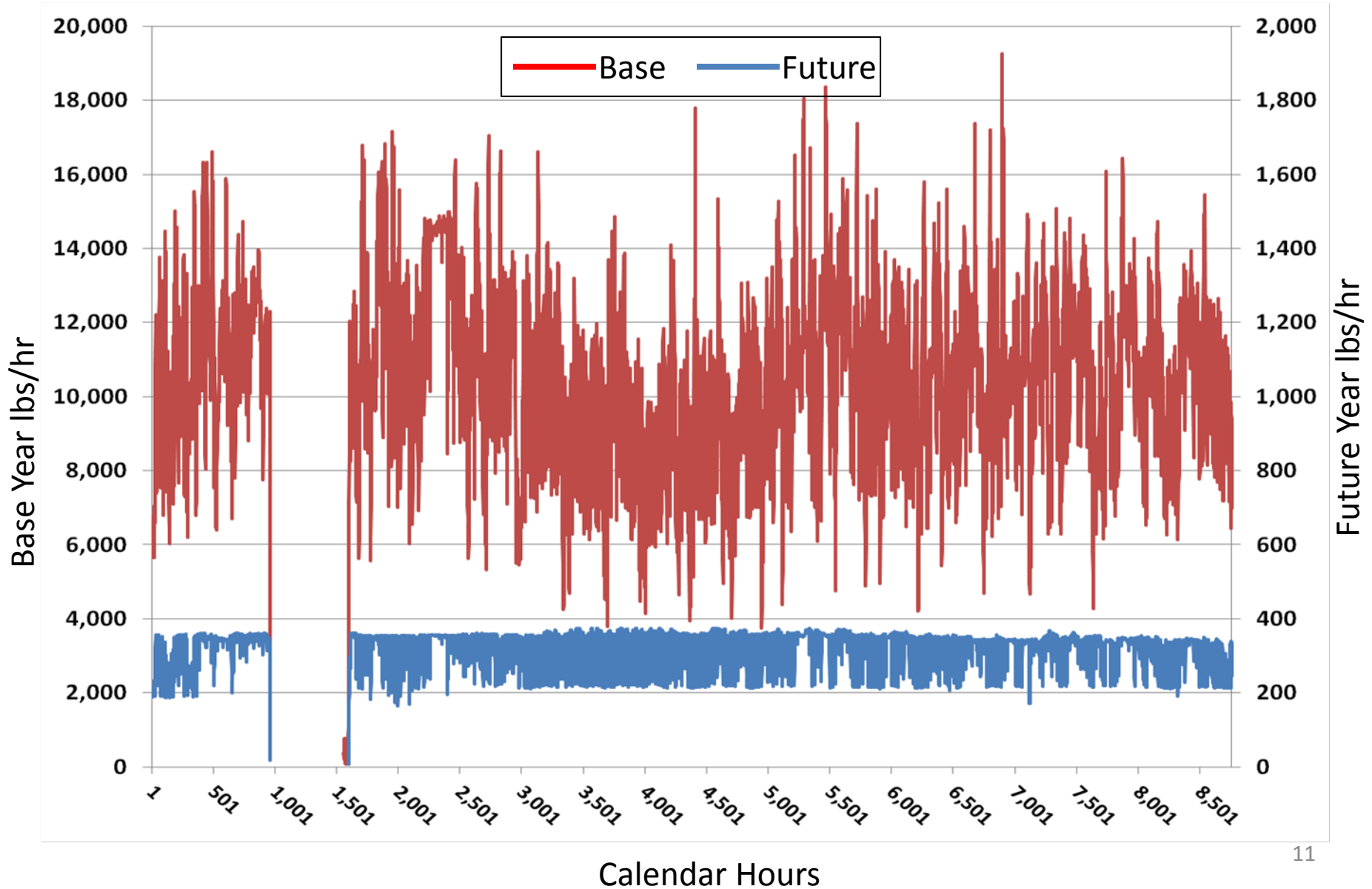


Unit Level Hypothetical Example Coal Fired Existing Unit, 800 MW



Hypothetical Unit Level Example

Coal Fired Existing Unit, 800 MW – SO2 Control



Benefits of ERTAC EGU Growth Tool

State-approved predictions

- No big swings in generation

- No unexpected unit shutdowns

Inputs are completely transparent

Software not proprietary

Hourly output files & reflect base year meteorology

- Hourly emissions reflect HEDD concerns

Quickly evaluates various scenarios

- Regional and fuel modularity

- Can test retirements, growth, and controls

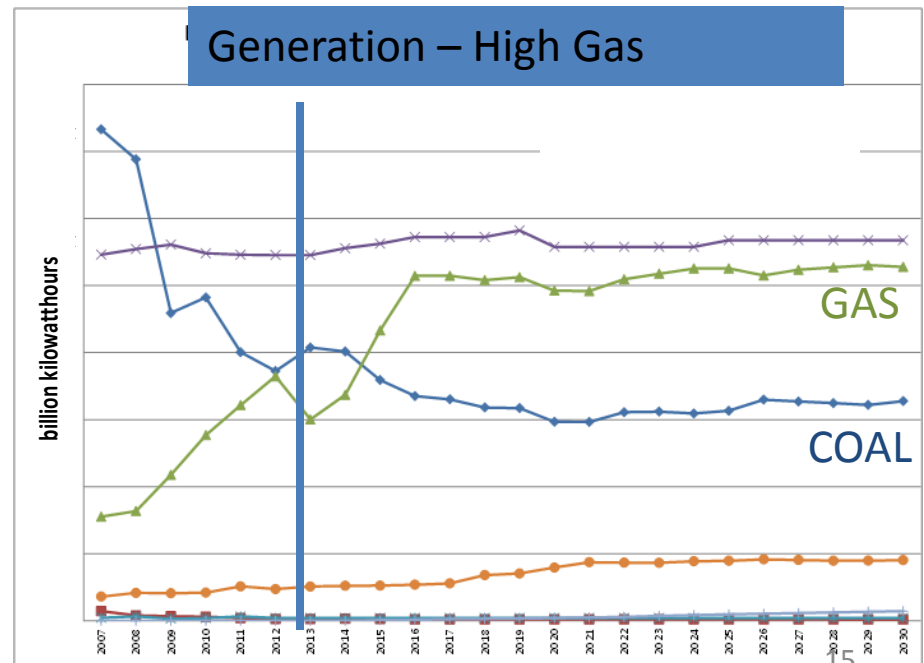
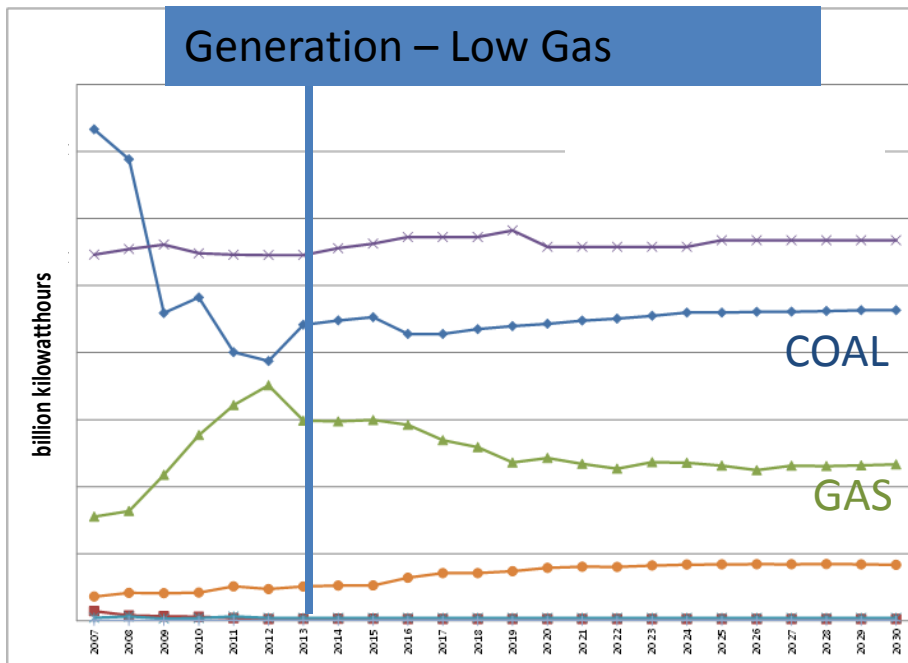
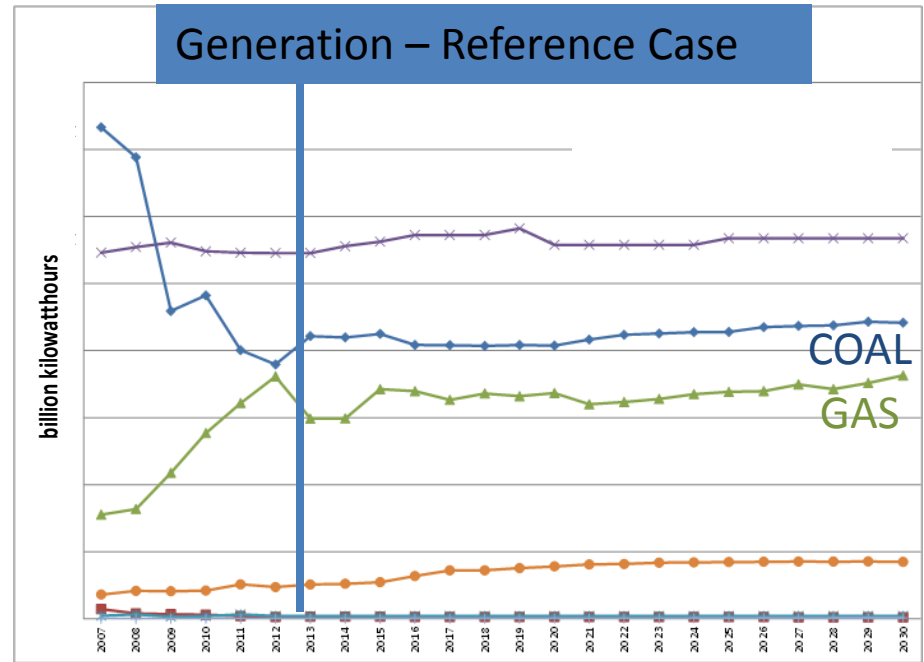
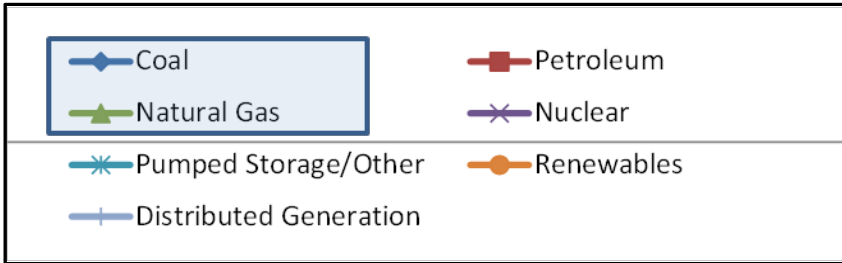
Project Status

- Completed run with 2007 & 2011 base years and 2013 AEO growth rates.
- Code complete to convert ERTAC EGU output to SMOKE inputs
- OTC is using ERTAC EGU v1.7 projection to 2018 & 2020 in CMAQ modeling.
 - 2007 fuels and emissions are basis
- ERTAC v2.0 is initial 2011 run

Examples of ERTAC Analyses

- How will emissions vary depending on forecasts of Hi/Low Gas vs Coal use
 - Analysis underway
- How will EGUs comply with MATS?
 - Looked at 5 scenarios
- Comparing 2018 EGU projections
 - ERTAC and EPA's IPM

Generation 2007-2030, Reference vs High & Low Gas



5 Scenarios for Meeting MATS

Flat Rate

Reduce all units to 0.2 #/mmBtu maximum future SO₂ emission rate if >0.2

Capacity

Small units same as flat rate. Larger units 90-98% SO₂ reduction if not already meeting 0.2 rate

Emission Rate

If future rate >1#/mmBtu then 90-98% reduction. Others at 0.2.

Retirement

Retire small units not meeting 0.2. Reduce others by 30%.

Fuel Switch

Switch small units to natural gas if not meeting 0.2. Reduce others by 30%.

- Results of MATS scenario analyses (2007)
 - NO_x – Not much reduction from any scenario.
 - SO₂ – Reductions smaller than anticipated by IPM.

Comparing 2018 Projections Based on ERTAC 2.0 & EPA 2011

State Heat Input: ERTAC & IPM similar

State SO₂ Emissions: ERTAC much higher than IPM. IPM optimistic about MATS impact.

State NOx Emissions: ERTAC higher than IPM.
Relates to use of controls.

Unit Shutdowns: IPM shuts down units not anticipated for closure by states

Some Observations on EPA Inventory

Based on EPA's Version 1 of 2018 Inventory

VA – Significant new wind power predicted.

Mobile sources require revision-numerous states.

CT – Generation shifted to MSW plants.

MD – IPM projects SO₂ emissions from all MD units controlled to 0.06 lb/mmbtu.

PA – IPM projects EGU NO_x emissions reduced from 0.35 to 0.07 lb/mmbtu.

Projected OTC Inventory Timeline

March 2014 – Update ERTAC EGU State Inputs – for version 2.2

April 2014 – New ERTAC Version 2.2 Runs Complete State Inputs
AEO 2014 Growth (Tentative)

June 2014 – State & Stakeholder Outreach

(July 2014 – Next round of ERTAC EGU state inputs)

August 2014 – Incorporate ERTAC EGU into inventory

Fall 2014 – AQ modeling using Version 2.2 ERTAC EGU

Summary

EPA will update 2011 & 2018 inventory this fall
OTC 2011 Modeling platform with updated ERTAC
EGU expected in late Fall 2014
Meanwhile 2007/2018/2020 modeling platform
provides best available basis for ozone modeling
ERTAC EGU is a great tool for inventory analysis

More info about ERTAC

- Documentation at:

ertac.us/egu

<http://marama.org/2013-ertac-egu-forecasting-tool-documentation>