Northwest Power and Conservation Council

Load forecast and treatment of conservation

July 28th 2010

Resource Adequacy Technical Committee

Massoud Jourabchi

How to incorporate conservation in the resource adequacy analysis

- How much conservation is implicitly incorporated in the short-term demand forecast?

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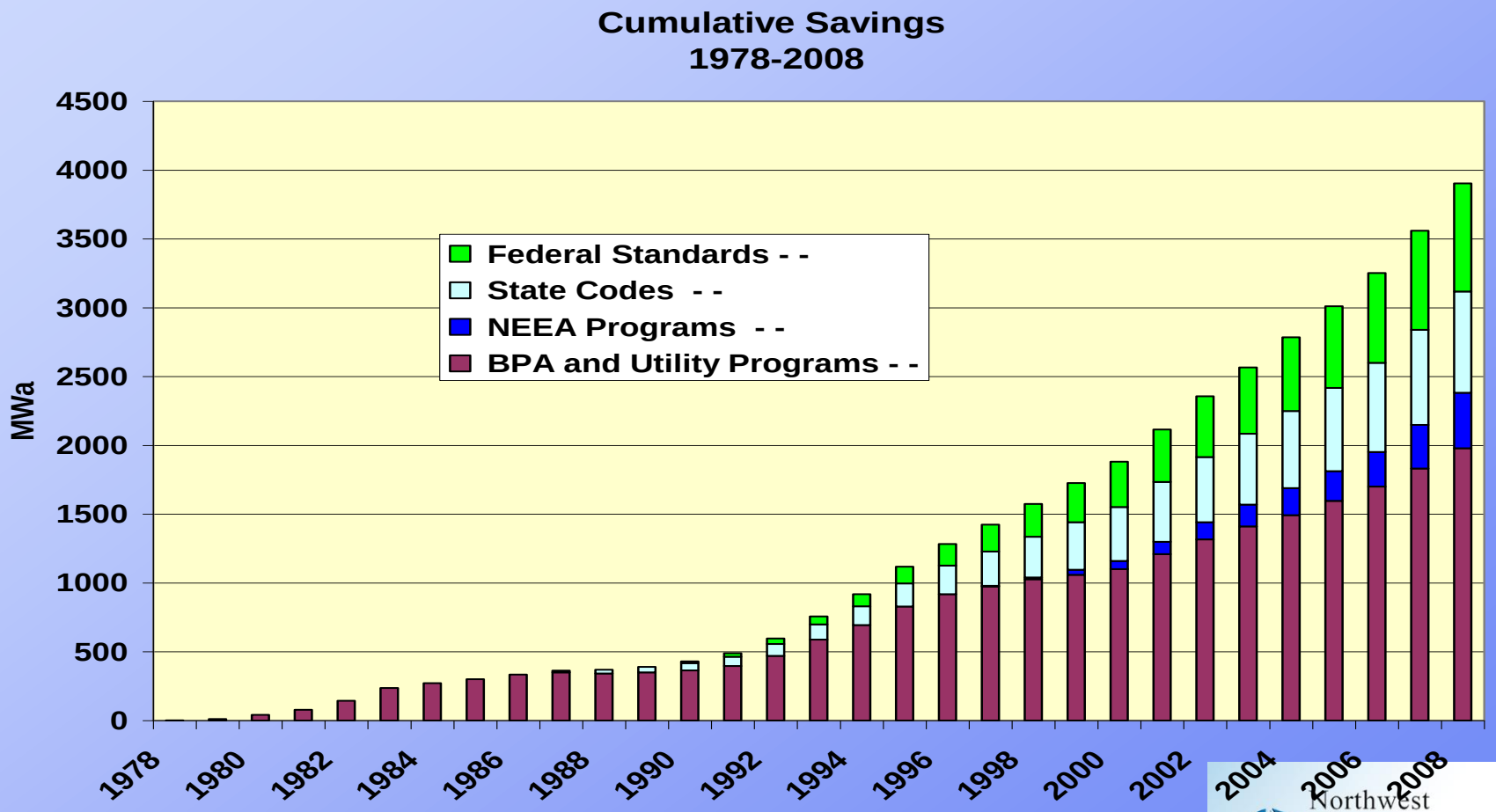
Incorporating conservation savings in the short-term model



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Incorporating conservation in the short-term model

- Our short-term model is an econometric model which can not explicitly forecast conservation due to the strong correlation between its key economic driver (employment) and conservation.
- However analysis shows a relationship between regional conservation and employment.

Incremental Conservation = + 0.11 * Employment - 393

- 92% of variations in historic conservation can be explained by variations in historic employment
- Our analysis shows that amount of conservation implicitly incorporated in the short-term forecast is close (slightly above) to the target conservations.

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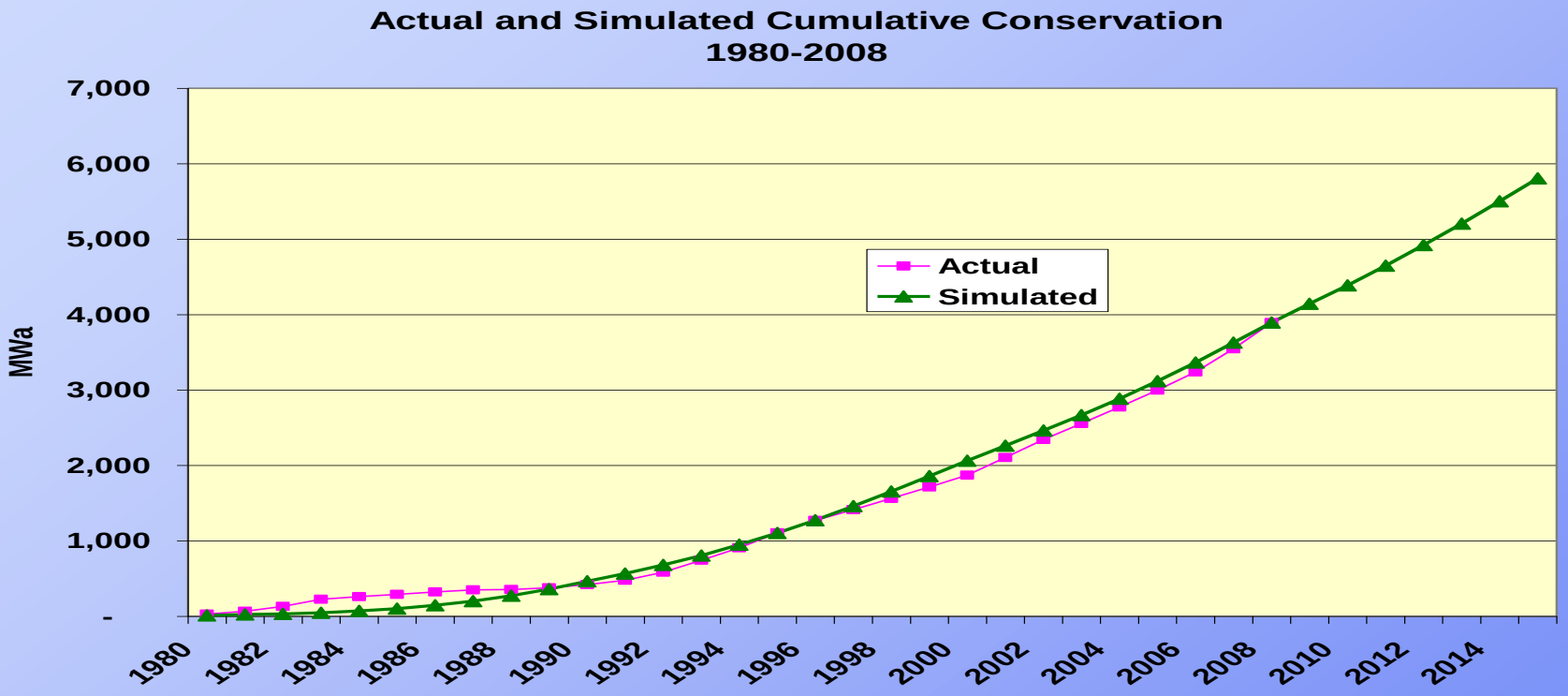
Comparison of actual and Simulated Trends in Conservation



Using past conservation achievements and employment as the driver provides simple model for overall conservation targets as employment changes

Inc. Conservation = + 0.11 * Employment - 393

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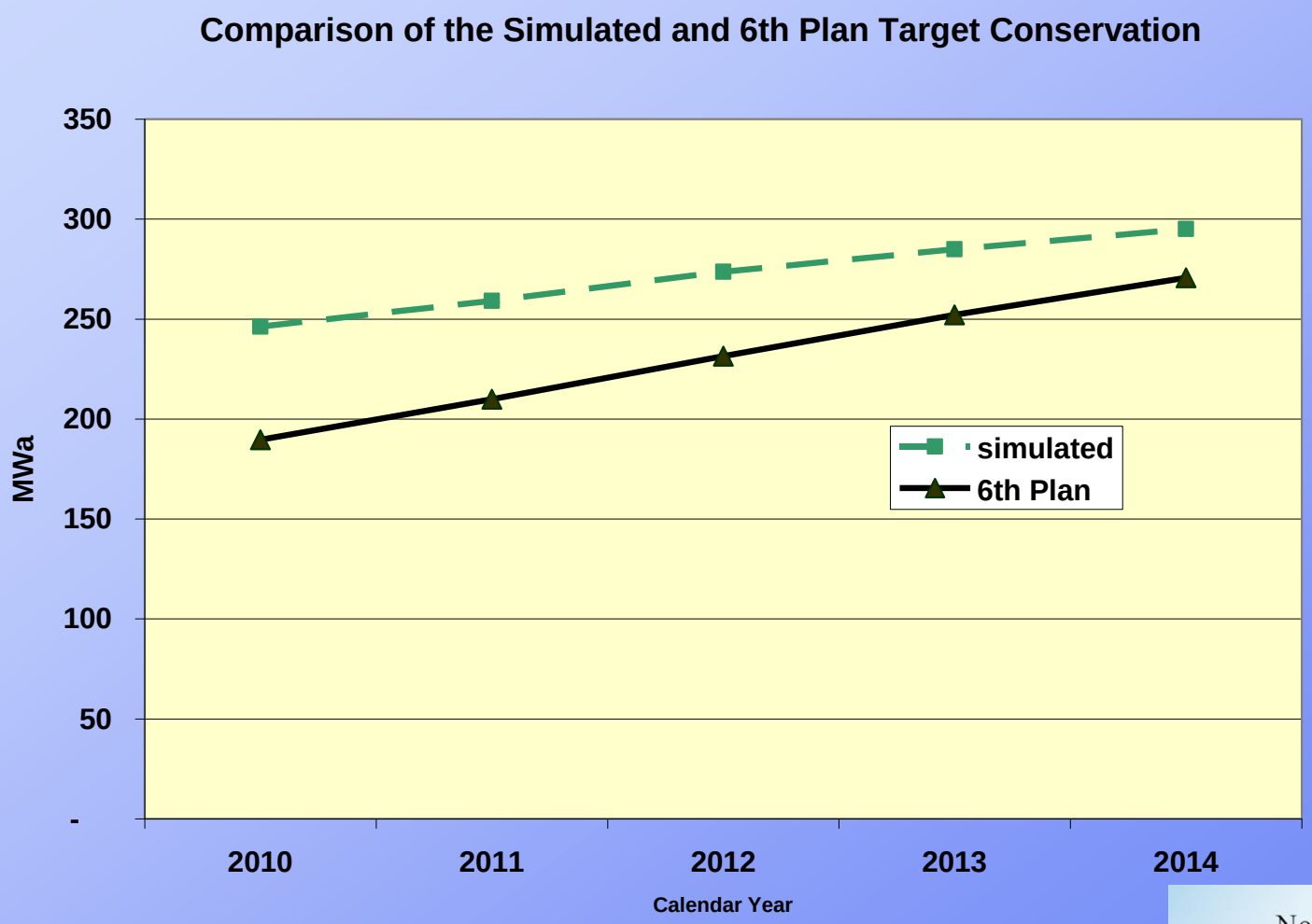
6th Plan targets are consistent with the past trend in conservation



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How to adjust amount of Conservation in the STM

- We have set up our modeling tool to be able to adjust the amount of implicit conservation in the load forecast.

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Changes to the short-term forecasting model

- The structural equations for short-term model were re-estimated using 1995-2009 hourly loads, using a log-linear form.
- The forecast of regional employment, the key driver to Council's short-term forecast, was updated using Global Insights June 2010 forecast. Economic recovery slower than was anticipated back in September 2009.
- Modified the STM so that the implicit conservation targets can be modified.

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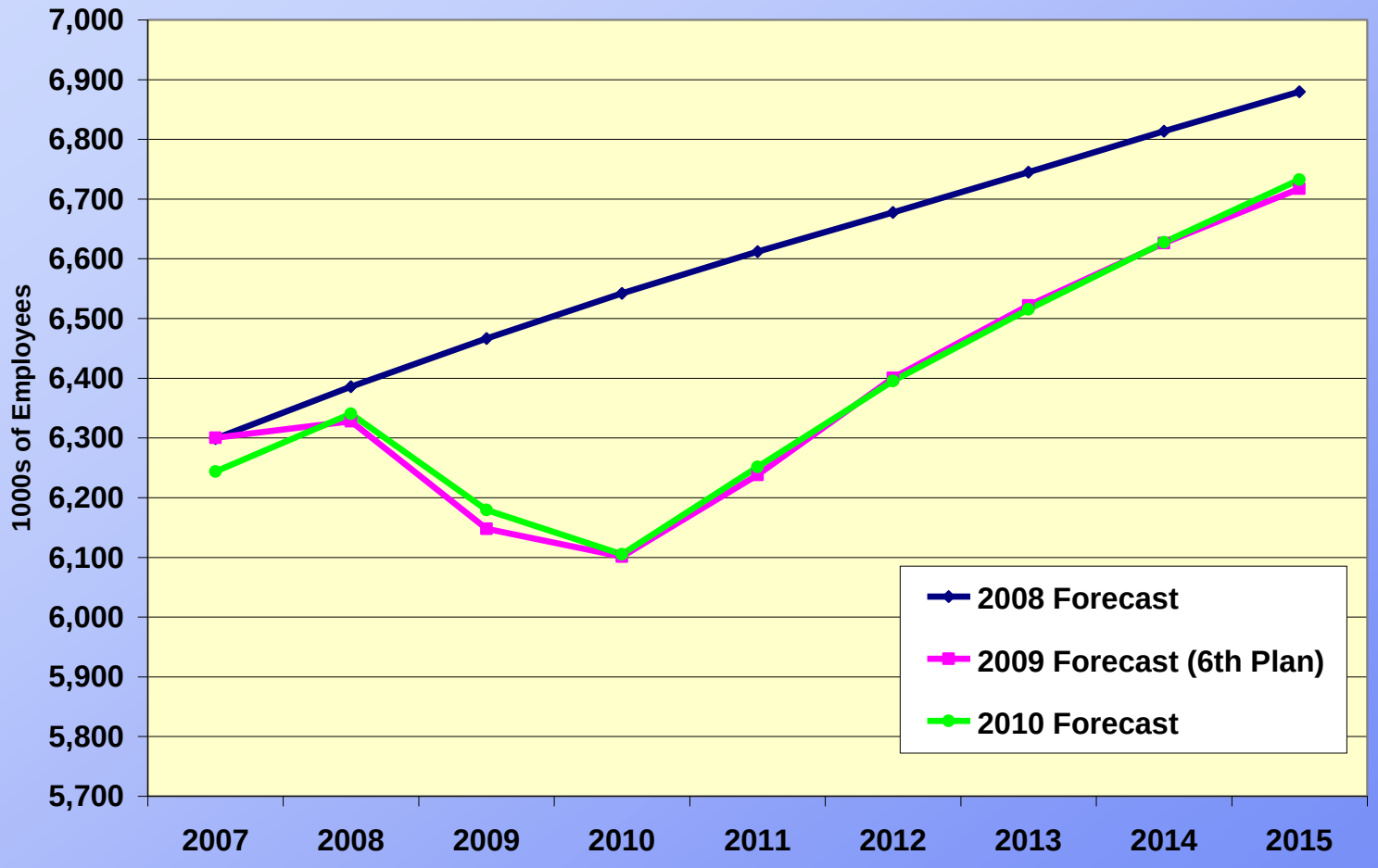
Employment Forecasts



Employment forecast relatively stable for 2012-2015.

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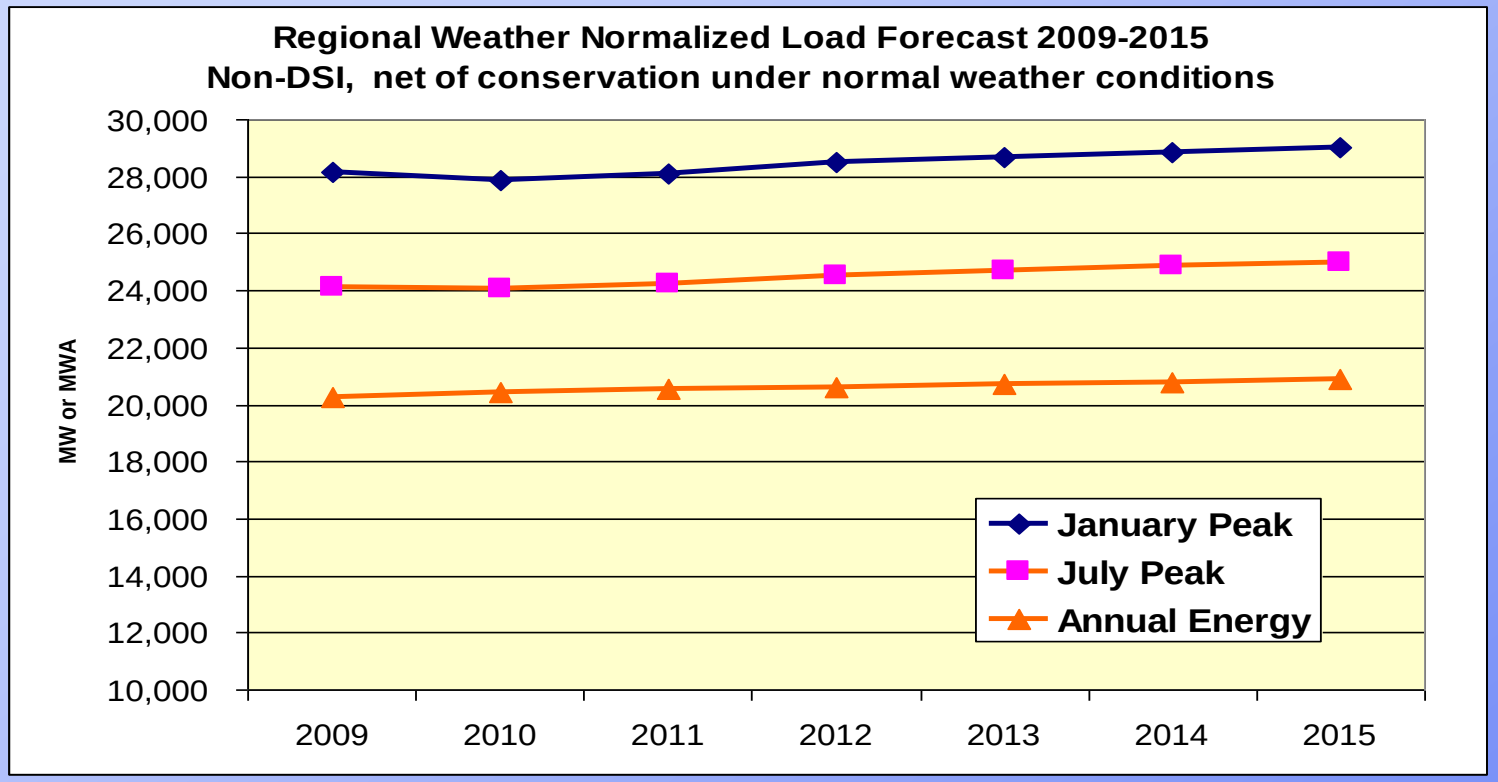
Over the next 6 years regional loads Forecasted to grow slightly



Energy to grow about 500 MWa

Winter and Summer peak to grow by about 1000 MW each

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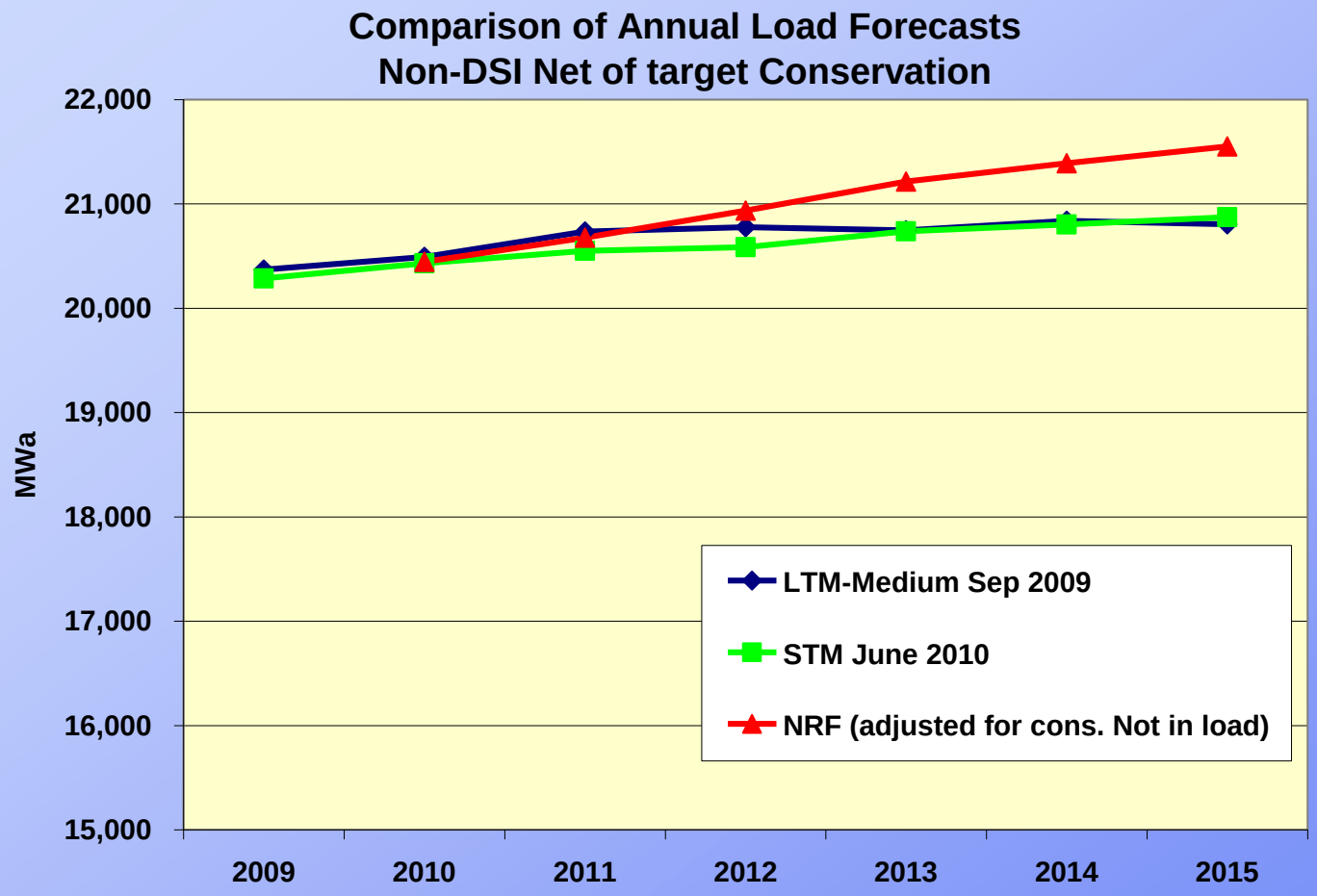
Comparison to Other Forecasts



Forecasts are very close in the next three years

In longer terms departing slightly due to difference in data vintage and conservation target assumption.

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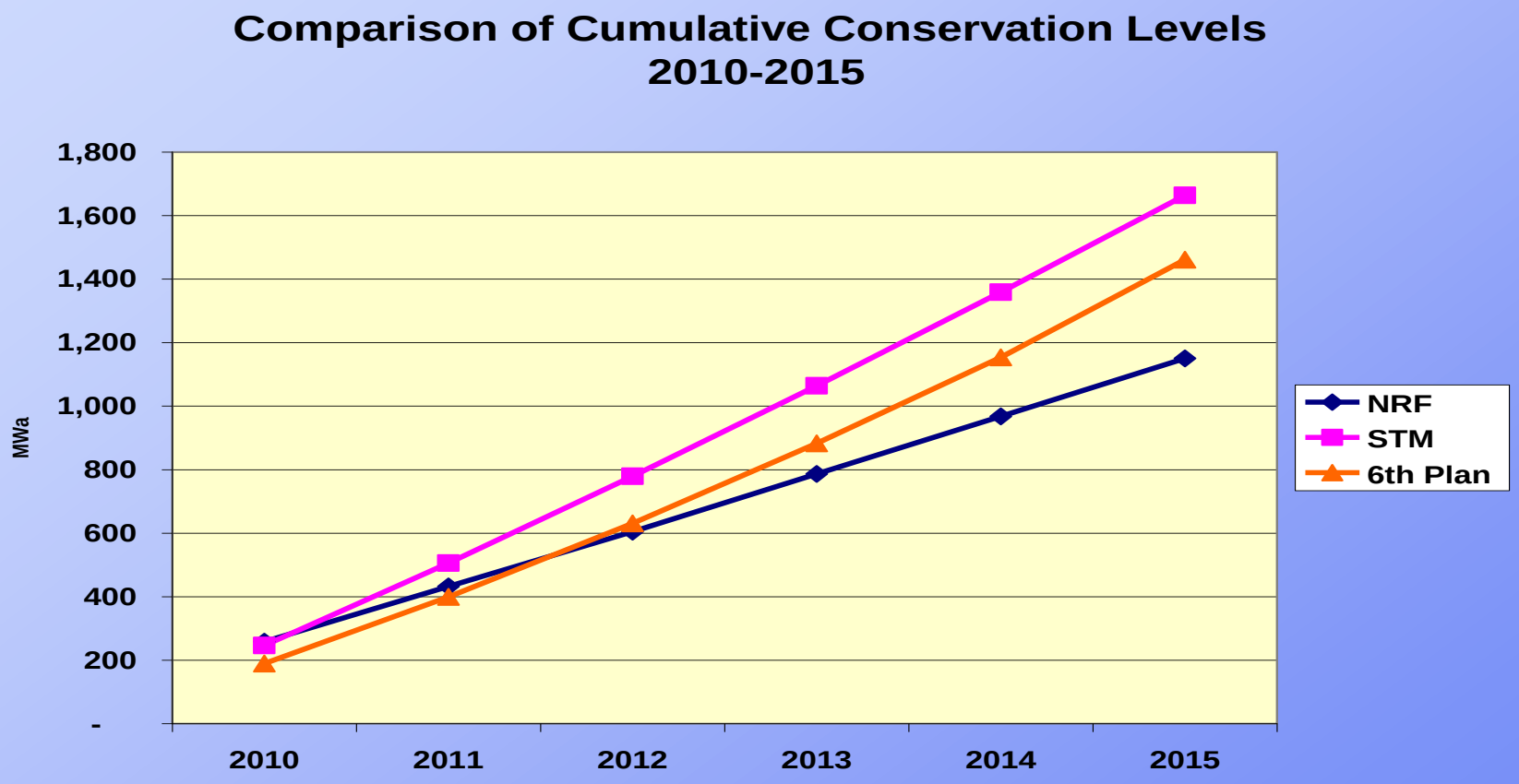
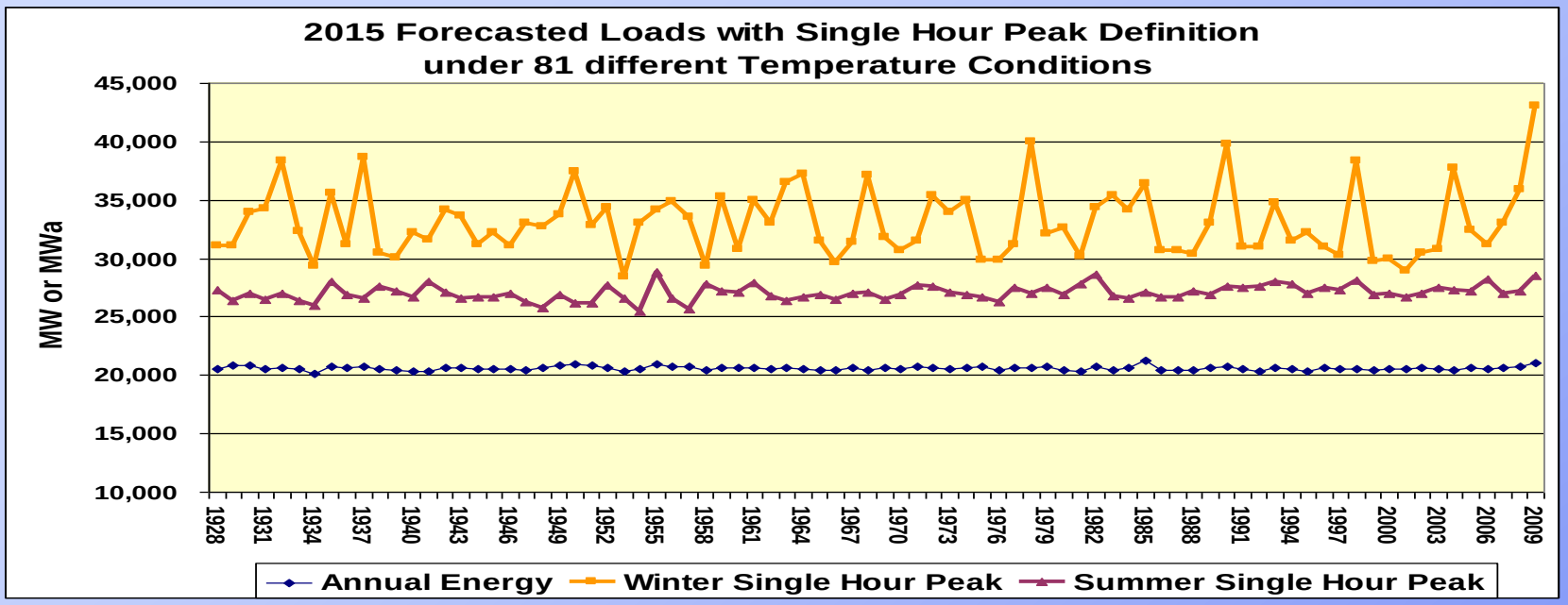
Comparison of NRF and the 6th plan shows levels of conservation acquisitions are close in the next three years.




2015 Forecasted Loads with Single Hour Peak Definition
under 81 different Temperature Conditions
MW or MWa
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40,000
35,000
30,000
25,000
20,000
15,000
10,000
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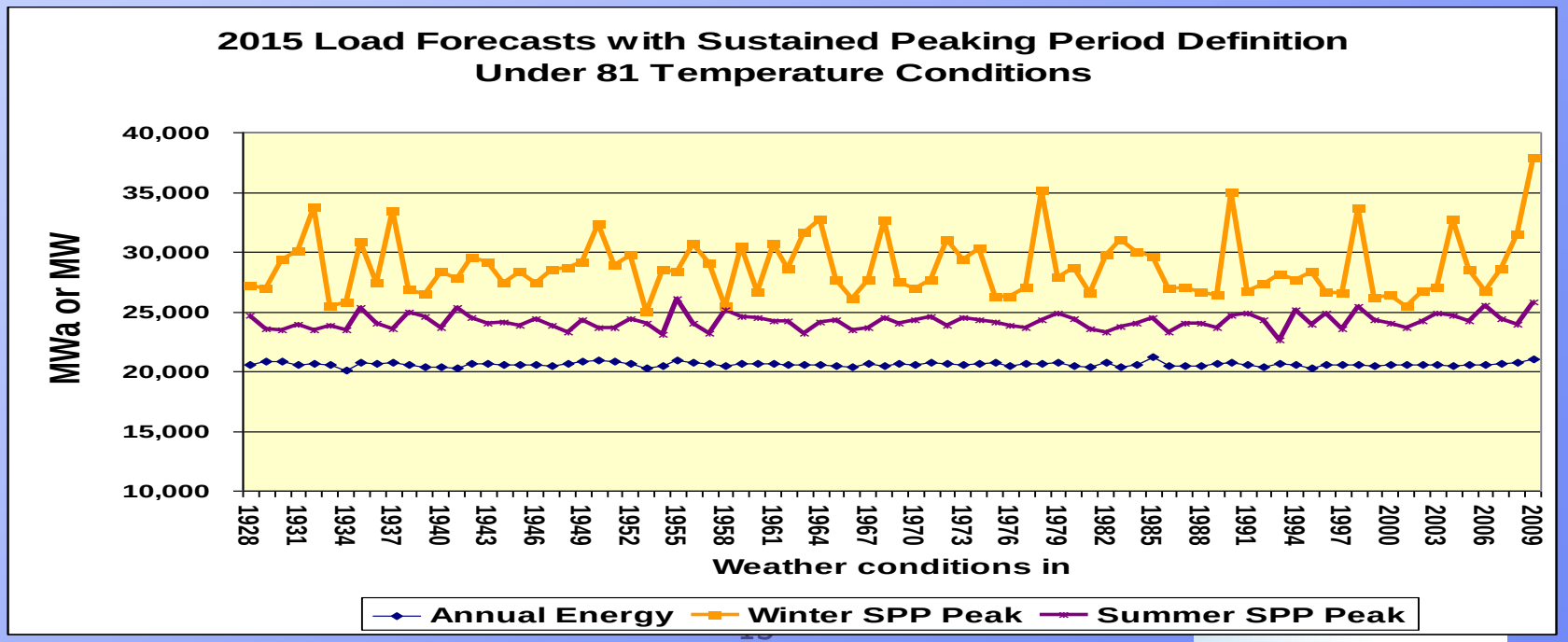
2009
Annual Energy
Winter Single Hour Peak
Summer Single Hour Peak


2015 Load Forecasts with Sustained Peaking Period Definition
Under 81 Temperature Conditions
MWa or MW
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Weather conditions in
Annual Energy
Winter SPP Peak
Summer SPP Peak