EE as a Resource

From the perspective of the
NW Power & Conservation Council

Tom Eckman

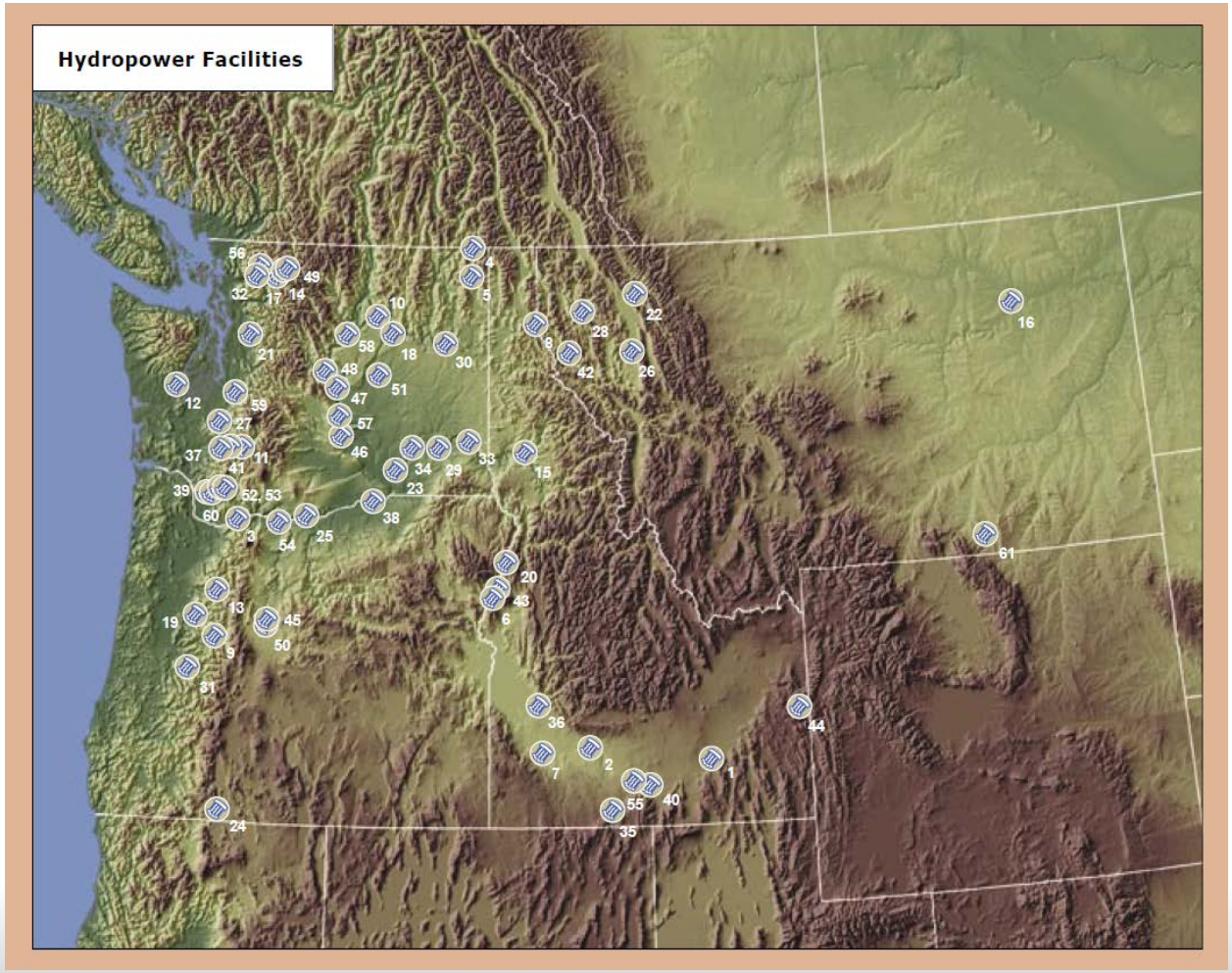
FIRST, A BIT OF HISTORY

Which you should all learn, because it's why you have a job in energy efficiency!

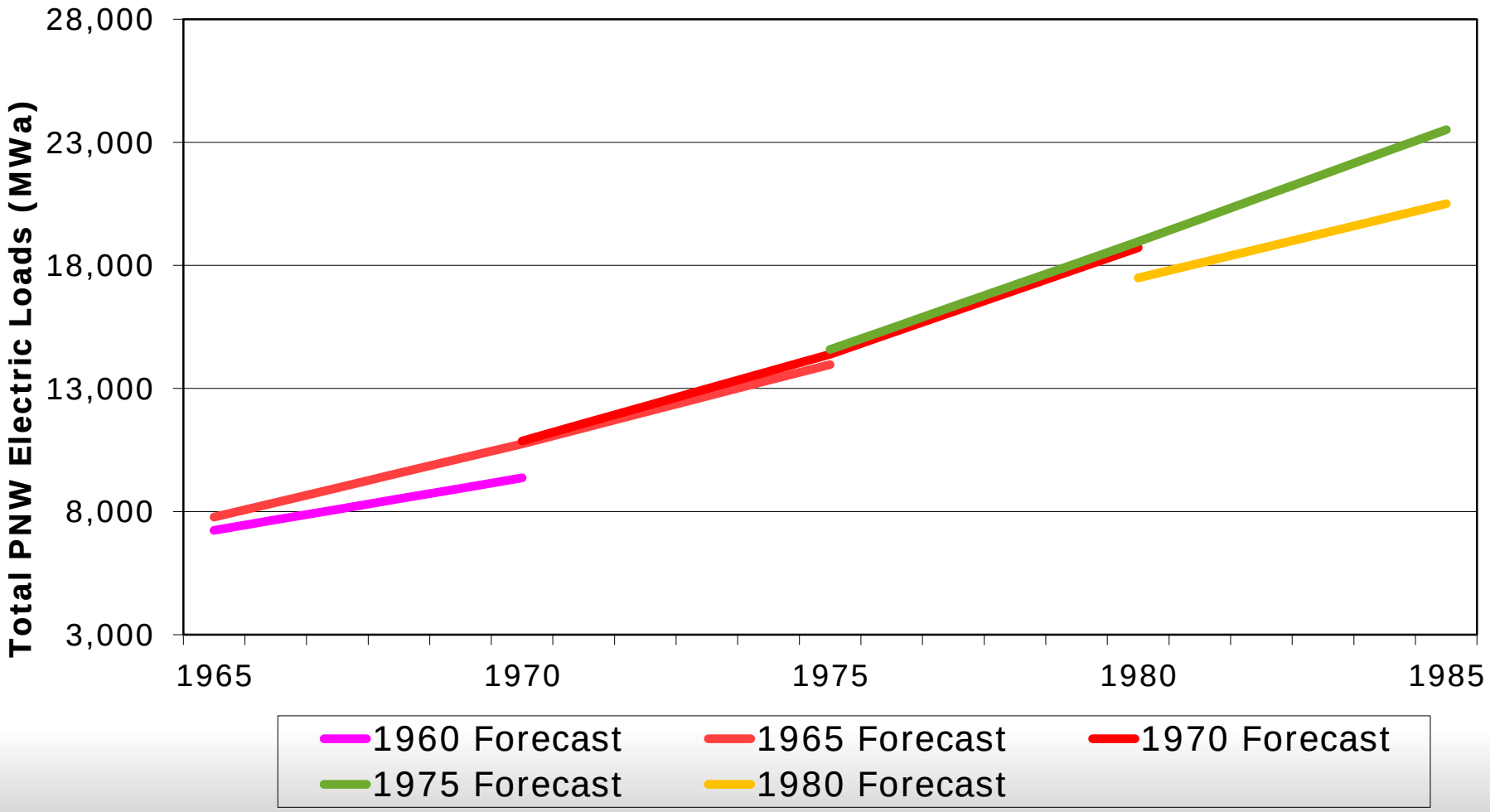
The First Three "Eras" of Power Planning in the PNW

- "New Deal" Mysticism (1930-1950)
  - Politicians plan using "chicken entrails and crystal balls" legislate what's needed and when
- Engineering Determinism (1950-1970)
  - Engineers, using graph paper and rulers schedule the next power plants
- Economic Determinism (1970 to April 27, 1983)
  - Economist, using price elasticity slow the engineer's construction schedules

Actions Taken in Response to “New Deal” Mysticism Forecast



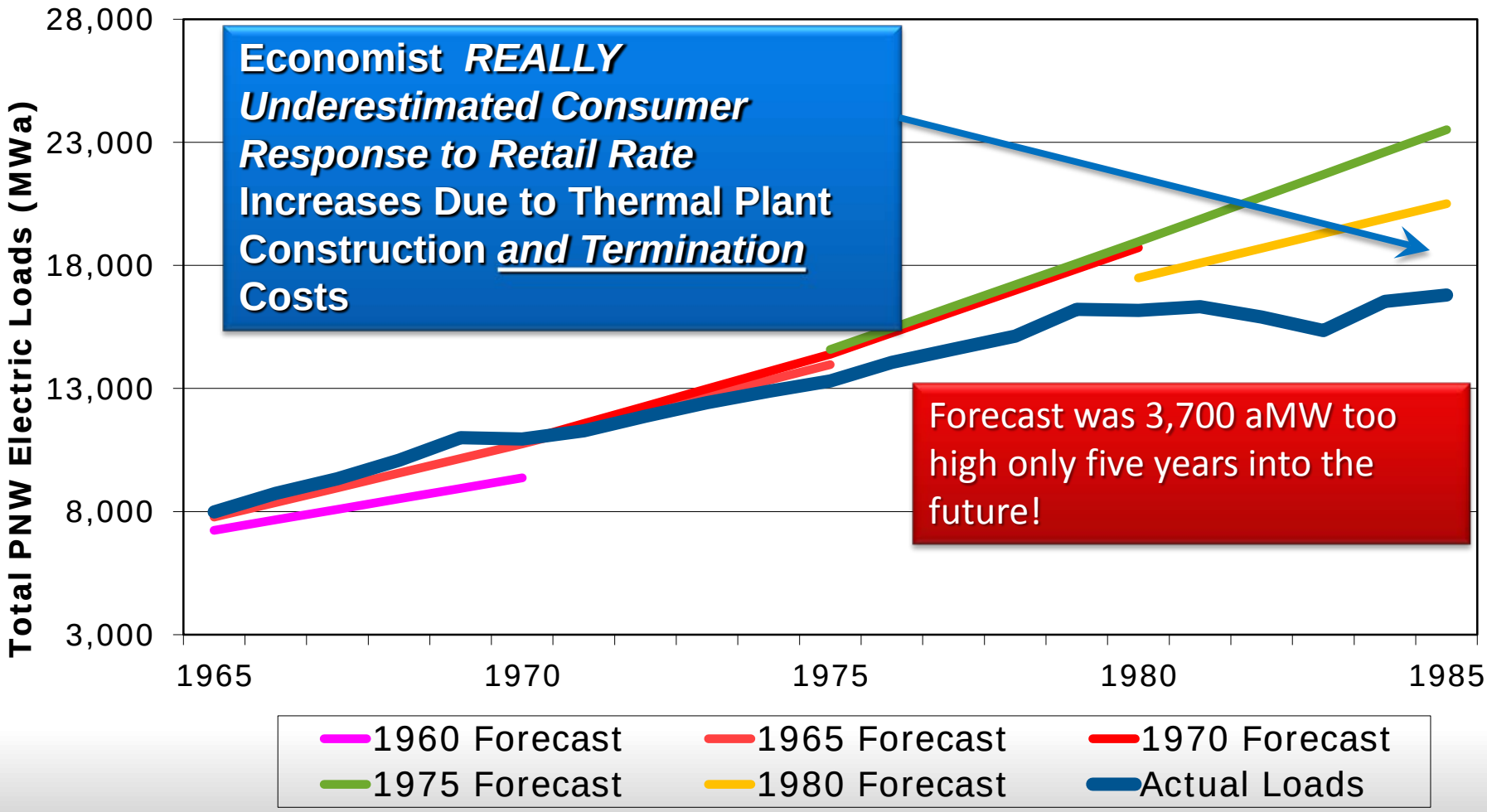
Regional Electricity "Engineering and Economic Determinist's" Forecast



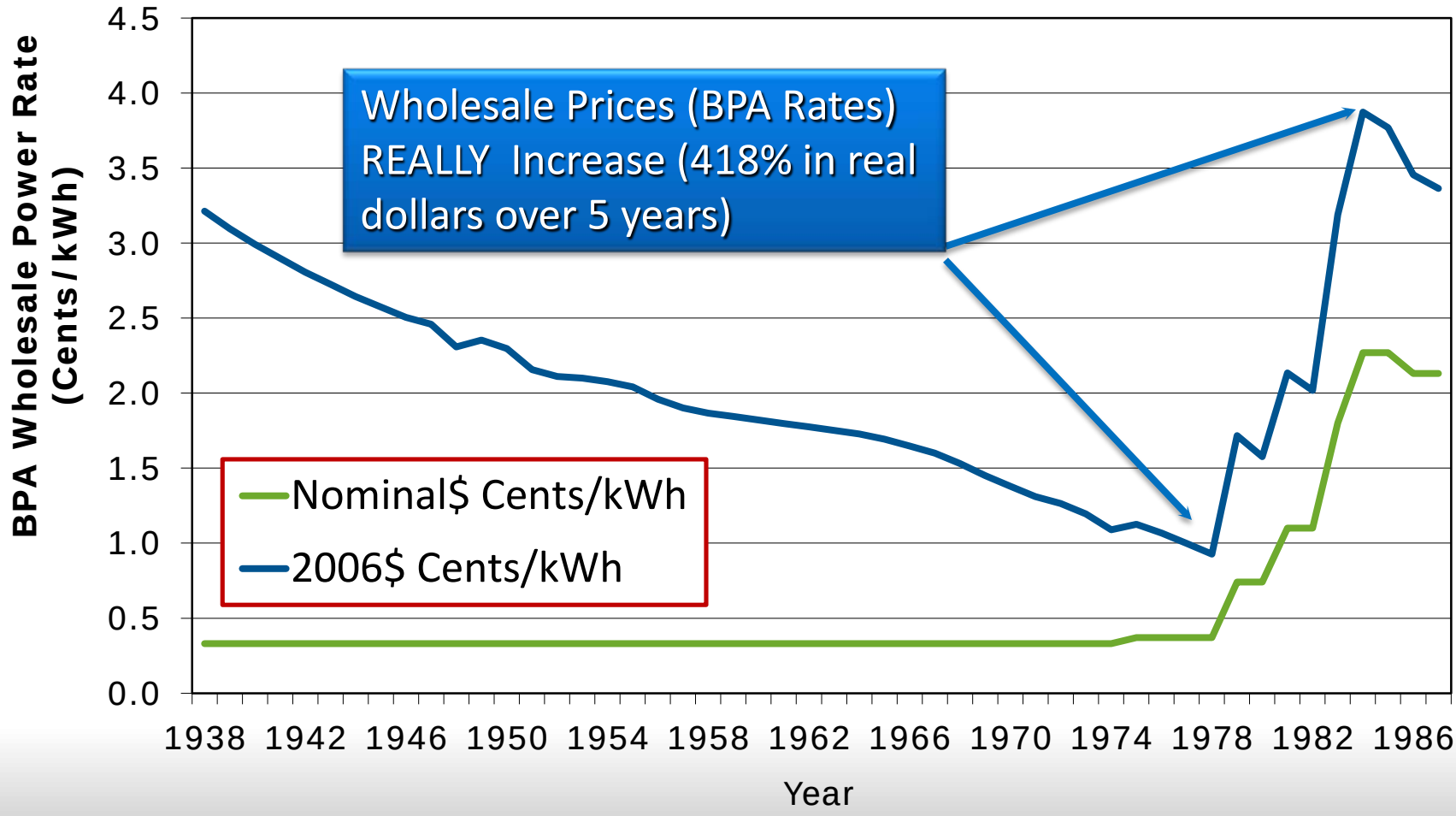
Actions Taken in Response to "Engineering and Economic Determinist's" Forecasts

- PNW Utilities planned and/or started construction on 28 coal and nuclear power plants to be completed over a 20-year period.
- Native American tribes sued the state and federal government over loss of salmon
- Environmental groups sued Bonneville Power Administration over plans to turn the Columbia River into "Wave World"

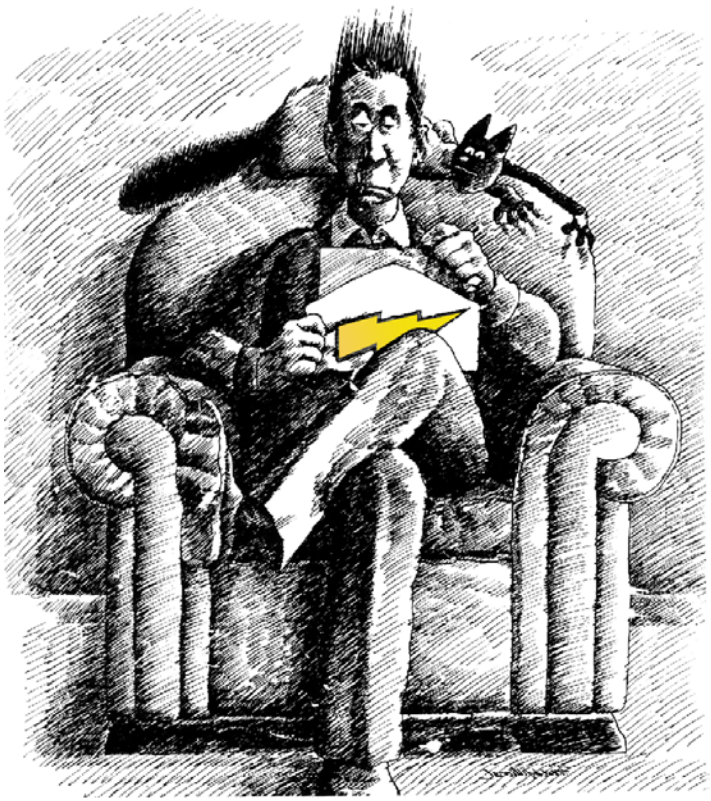
Regional Electricity "Engineering and Economic Determinist's" Forecast vs. Actual Use 1960 to 1985



Impact of Actions Taken in Response to "Engineering and Economic Determinist's" Forecasts and Resource Development



Impact of Actions Taken in Response to "Engineering and Economic Determinist's" Forecasts



- Terminate or mothball 9 nuclear and 5 coal plants at a cost to the region's consumers of more than $7 billion.
- Motivated the region's politicians, utilities, larger industries and public interest groups to accept the "deals" embodied in the *Northwest Power Planning and Conservation Act of 1980*

“Thus the thing began”*

- Power Act gives priority to conservation
- At that time, utilities were principal, if not sole, source for EE measures
  - First program: Pacific Power & SCL Weatherization – 1978 “conscience money” after large rate increase
- Region did not have to worry about attribution
  - Momentum savings = 0

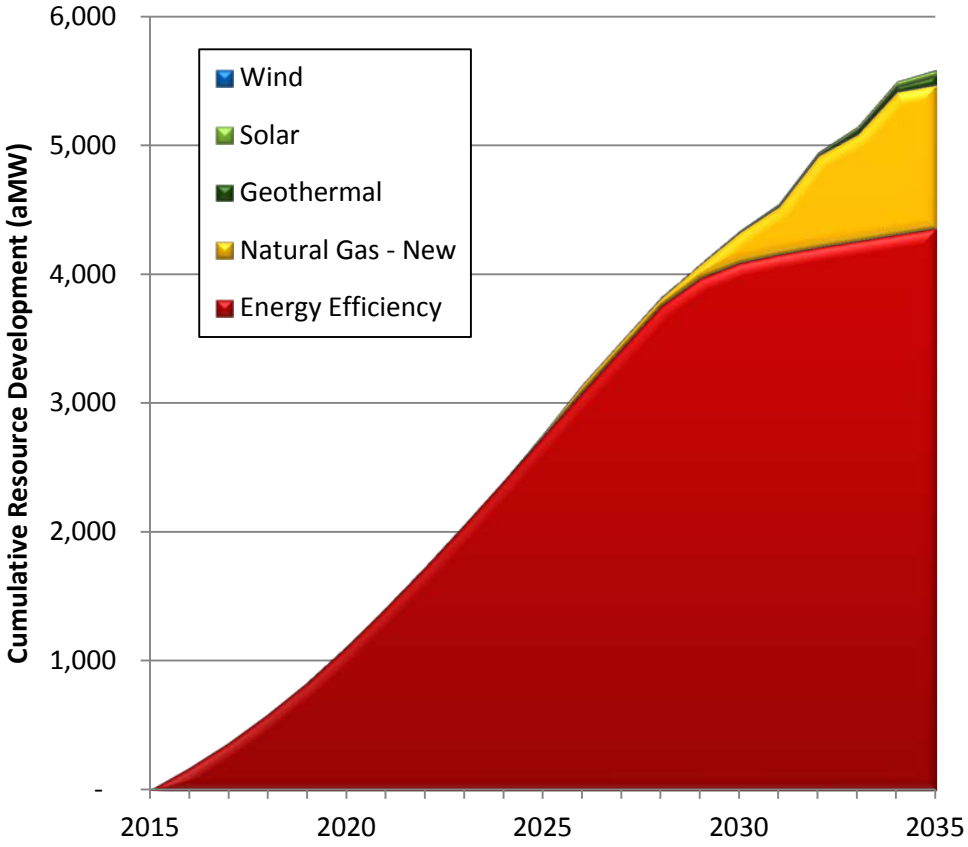
*Thomas Hardy

Tina Jayaweera

UNDERSTANDING EE IN A POWER PLAN

Why do we do energy efficiency?

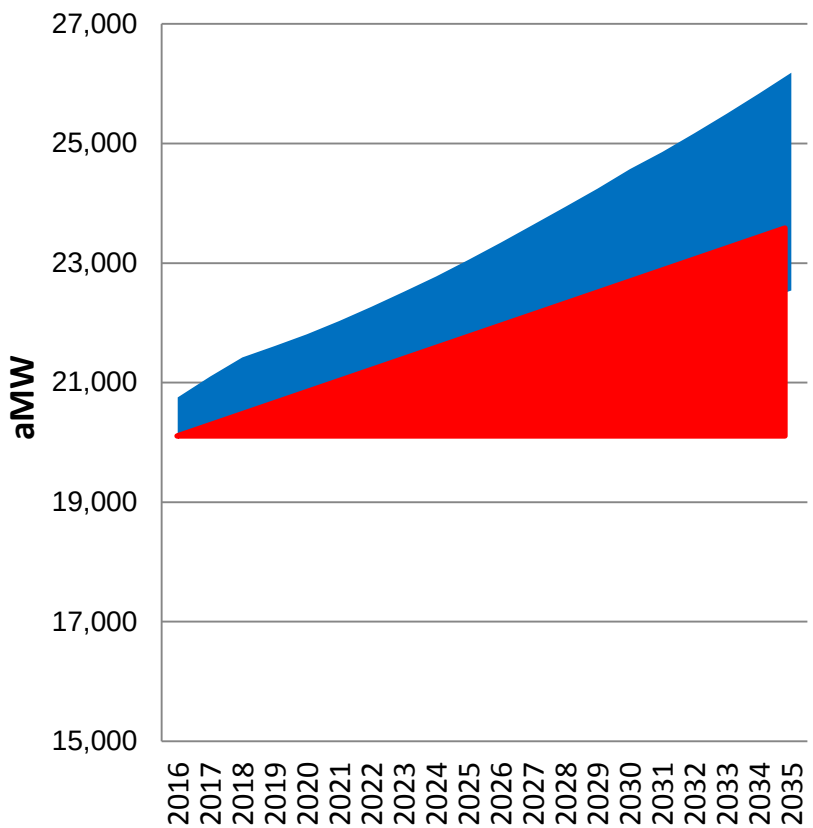
- It's the least-cost resource to meet demands (energy and capacity)
- How do we know this?
  - Integrated Resource Planning



What is an Integrated Resource Plan?

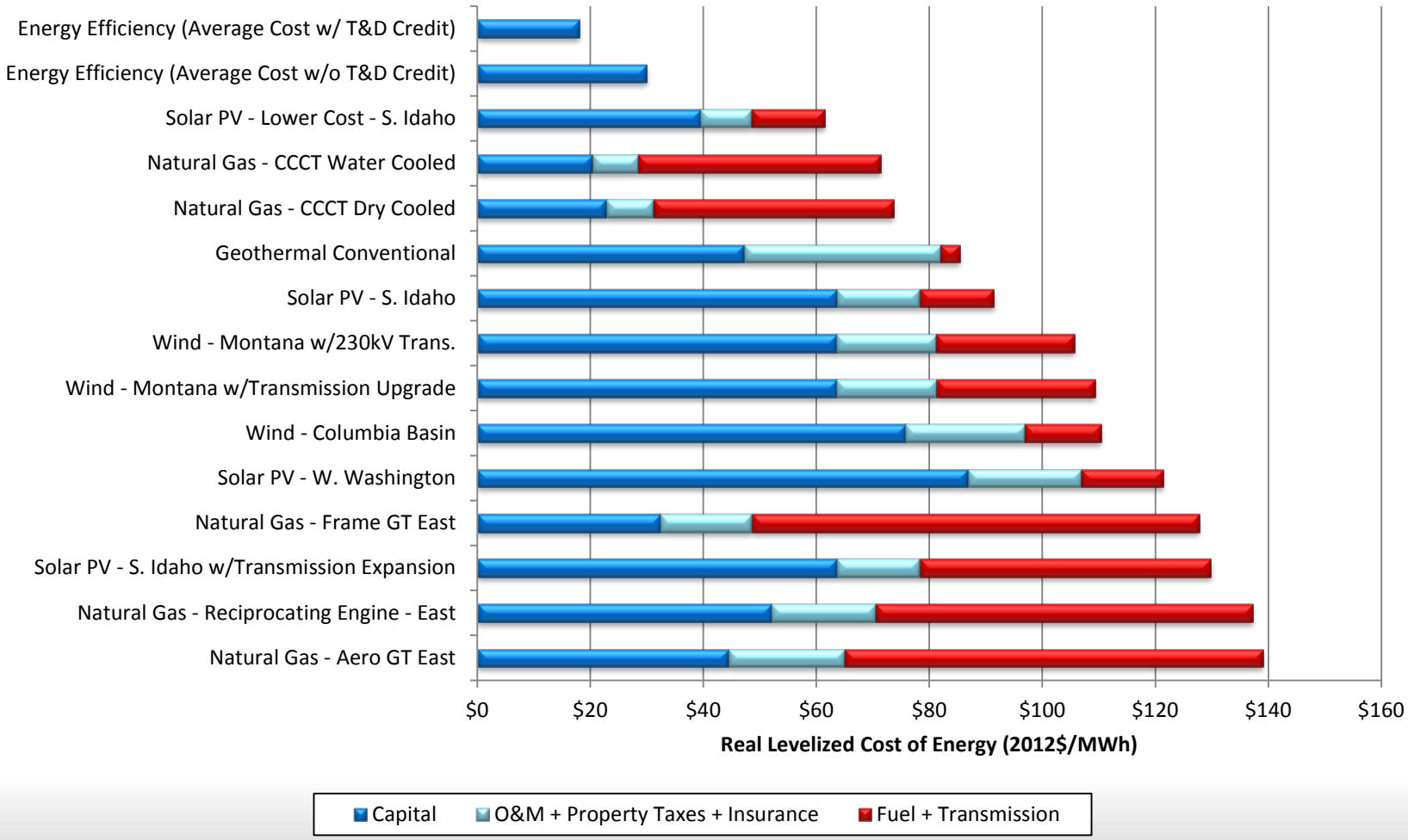
- "A plan for meeting forecasted annual peak and energy demand…through a combination of supply-side and demand-side resources over a specified future period." (Regulatory Assistance Project)

Demand Forecast

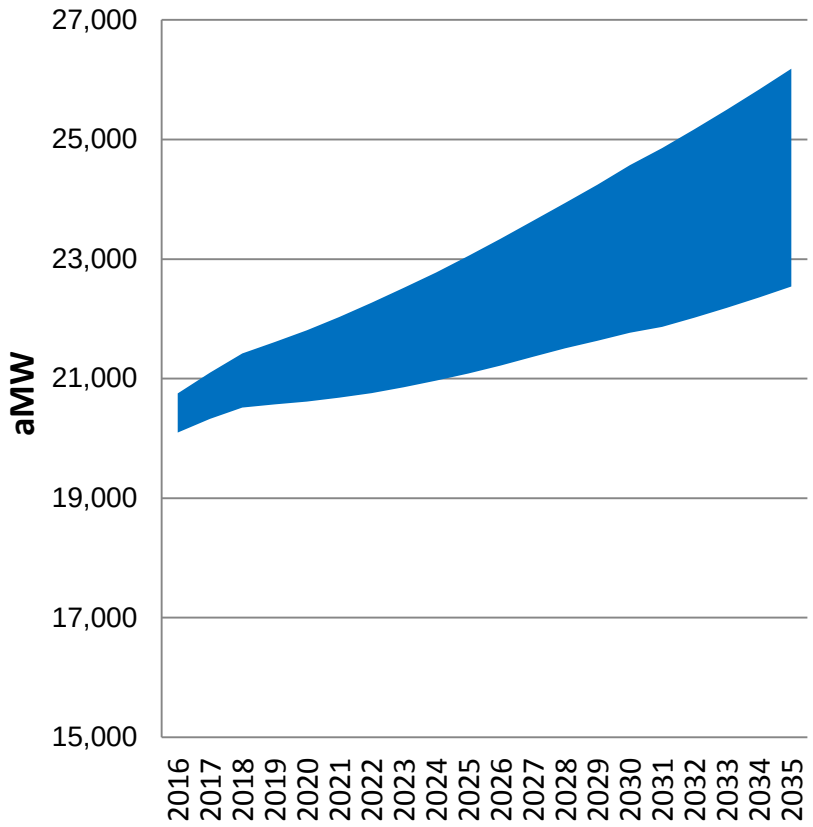


- Projected range of growth in energy demand
- What resources will be needed to meet energy and capacity demands?
  - Optimizing by cost

Comparing Resource Costs



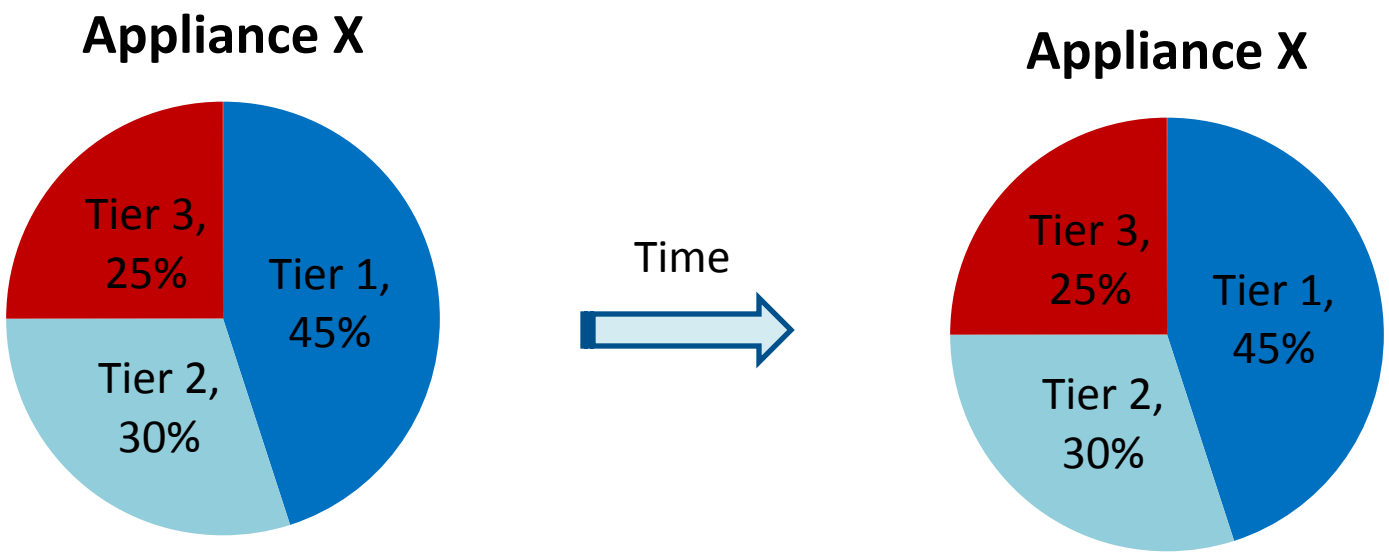
Demand Forecast



- Built up from technology/end-use & sector use per customer
- Assume "frozen efficiency" forecast to avoid double-counting with EE resources
  - However, forecast does account for stock turnover
  - Average end-use consumption changes with time

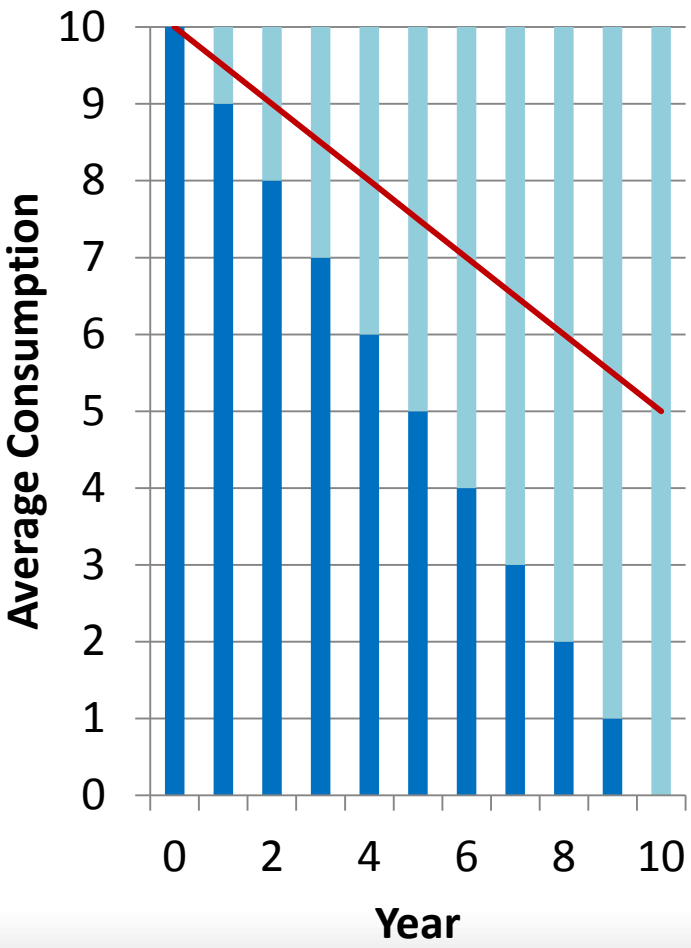
Frozen Efficiency Baseline Forecast

- Efficiency is fixed at the start of the plan period based on market knowledge



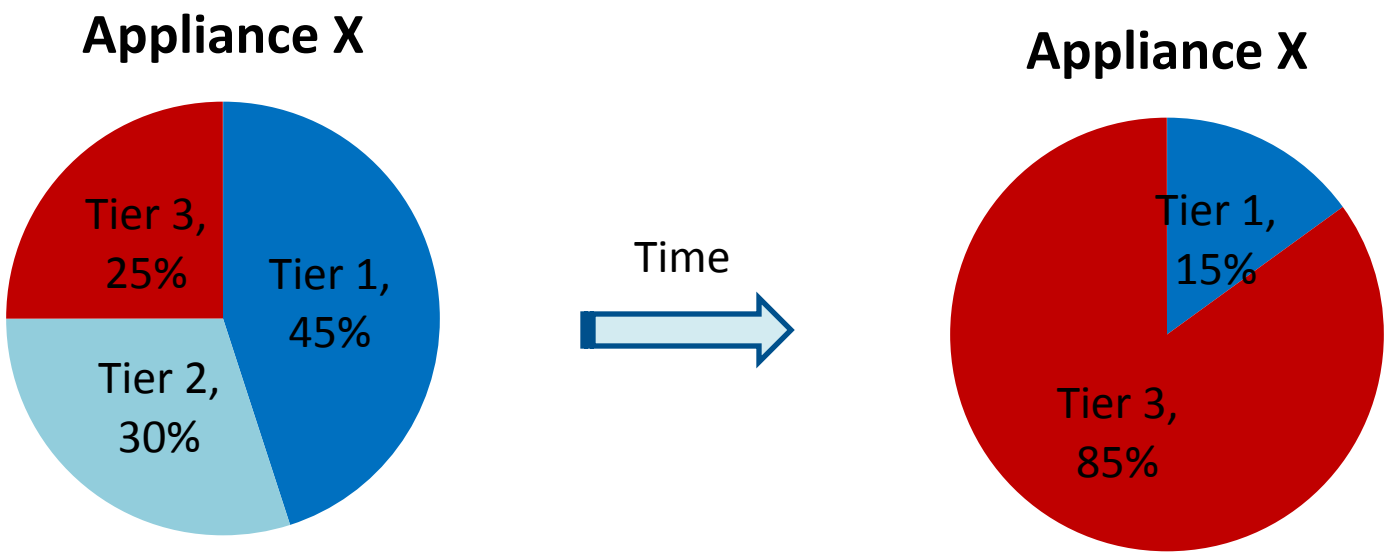
Stock does Improve

- Old units below current standard
- Old unit uses “10”, New unit uses “5”
- As New replaces Old, stock consumption decreases



Energy Efficiency is Above Baseline

- EE measures savings above baseline



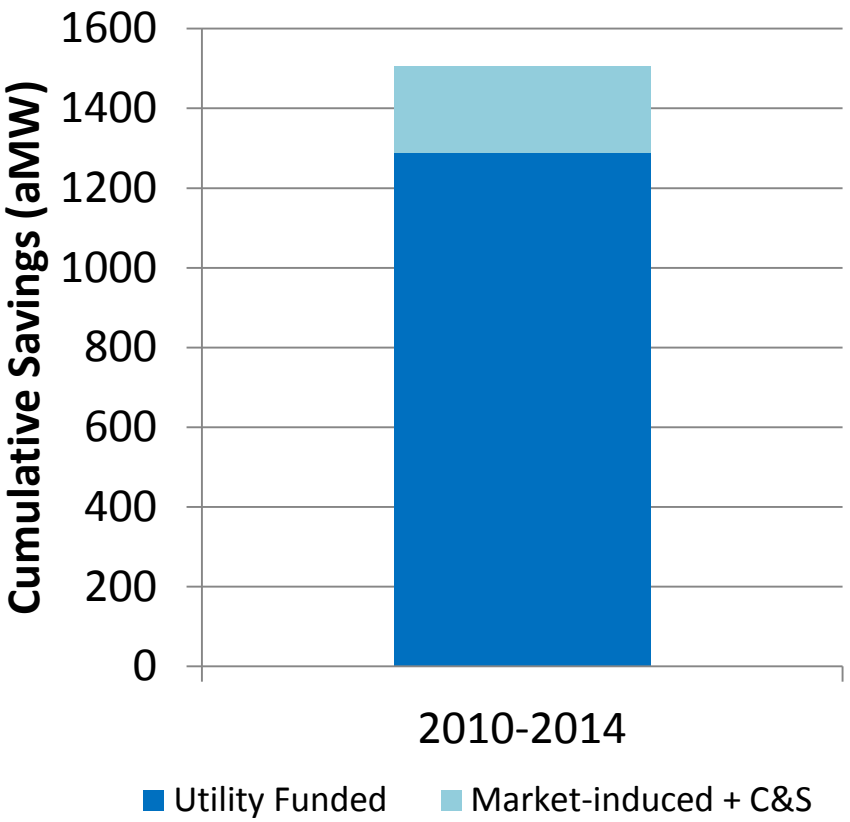
What does 7th Plan Find?

- EE above baseline helps meet demand
- Council has found that ~3,000 aMW of EE will meet nearly all regional demand through 2026 at the least cost

→ The region should acquire any cost-effective EE to assure a low-cost & reliable power supply

EE Acquisition

- EE can be acquired through:
  - Utility programs
  - Codes & standards
  - Market induced
- To meet demand, *all* cost-effective acquisition channels are valuable

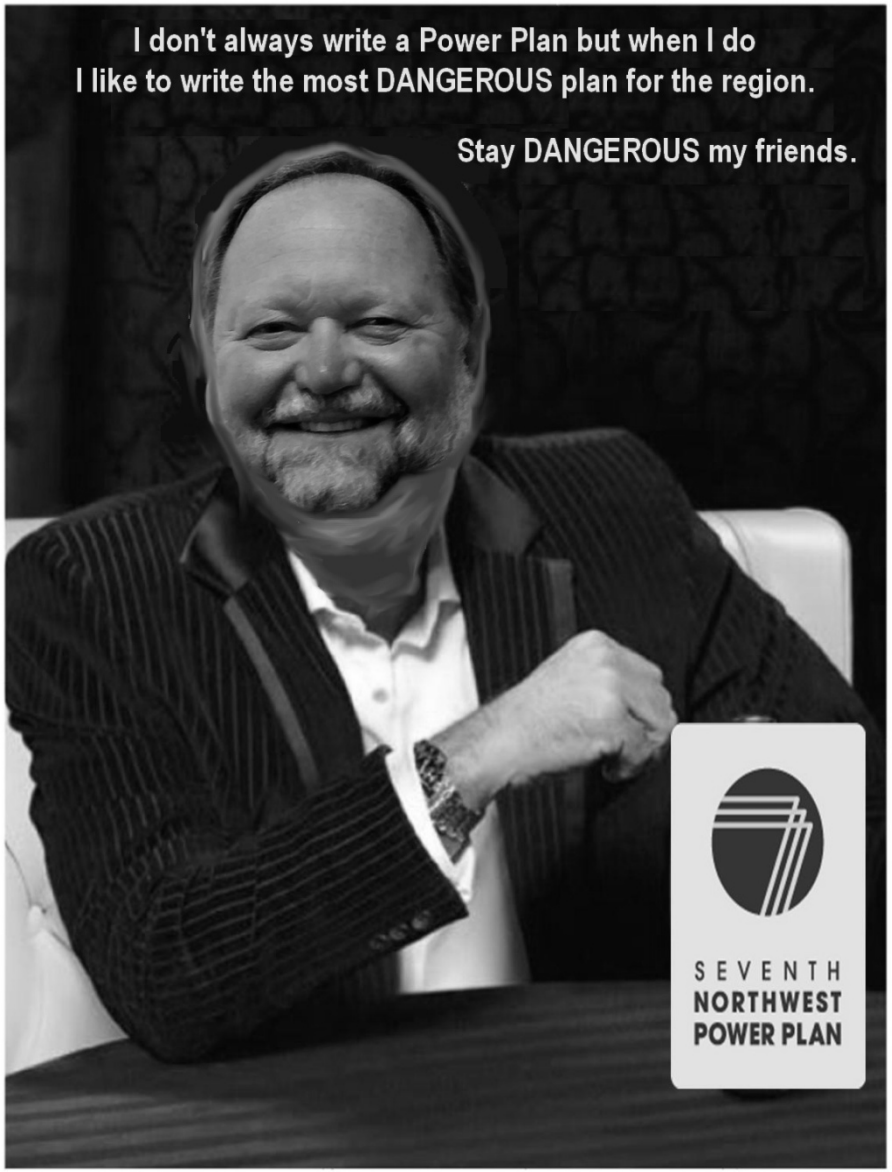


Plan ➡ Programs

- Plan potential ≠ Program requirements
  - Plan looks at (near) universe of measures
  - Some measure savings will happen outside of programs
    - Codes & standards
    - Market driven
- Market research helps inform trends

In Summary

- Council is agnostic to why EE is acquired
  - As long as it's cost-effective, it is a good idea
  - Program effectiveness *does* matter
- Understanding market dynamics leads to:
  - Better load forecasting
  - Better use of rate-payer dollars


I don't always write a Power Plan but when I do
I like to write the most DANGEROUS plan for the region.
Stay DANGEROUS my friends.
SEVENTH
NORTHWEST
POWER PLAN