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November 6, 2008

MEMORANDUM

TO: Power Committee

FROM: Massoud Jourabchi

SUBJECT: Economic Drivers of 6th Plan's Load Forecast

The demand for goods and services drives the demand for energy. The demand for energy is further influenced by consumers' choices about the energy efficiency of their homes and businesses, equipment and appliances, and how their equipment and appliances are used. This presentation discusses the key economic drivers of the Sixth Plan, such as the number of homes, square footage of buildings, and the output of industrial sectors.

The key driver that ultimately determines economic activities and their energy requirements is population growth. In the past two decades, regional population has grown from roughly 9 million in 1985 to over 12.6 million in 2007. This growth rate surpasses the national growth rate in population by almost 40 percent. Typically, this level of increase in population would significantly increase the demand for electricity. However, due to regional conservation investments, the increase in the region's demand for electricity has been kept in check. For example, between 1990 and 2007, the U.S. population grew at an annual rate of 0.9 percent while residential demand for electricity grew at 2.4 percent. In the Northwest, the average growth rate in population was 1.3 percent while the residential demand for electricity grew at an annual rate of 1.4 percent, a full percentage point below the national average. Similar patterns can be observed in the commercial sector.

To forecast the energy requirements of the future economy, internal and external forecasts of the economic drivers were developed. Three scenarios are considered: the medium, or base case, a pessimistic case, and an optimistic case. The pessimistic scenario is reflective of a future with slow economic growth, weak demand for fossil fuels, declining fuel prices, slower labor productivity growth, and a low inflation rate. In this pessimistic scenario, economic concerns weaken the reaction to climate change. No federal or regional cap-and-trade or CO₂ tax is implemented. On the other hand, the optimistic scenario assumes faster economic growth, stronger demand, higher prices for fuels, stronger growth in labor productivity, and a higher inflation rate. In the optimistic scenario, climate change concerns, demand for cleaner fuels, and a national CO₂ cap-and-trade system, or tax, pushes fuel prices to a higher trajectory.

The Economic Drivers of the 6th Plan Demand Forecast

November 14, 2008
Massoud Jourabchi



What this meeting will cover...

- Quick review of National Economic Forecast
- Review of Base Regional Economic Forecast
- Discussion on two alternative Economic Scenarios
- Topics for next meeting



Brief Review of National Forecast

Recession in 2008-2009?

- 25% chance of deepening recession in 2009 if financial packages can not unfreeze lending
 - GDP contracting 2% in 2009
 - GDP growing 0.8% in 2010

- Source: Global Insight, October 2008

Slow Down in US Economy

Growth rate			
1990-2007	2008-2010	2010-2030	
3.43%	2.6%	3.50%	Industrial Production--All Manufacturing
3.22%	1.6%	2.44%	Real Gross National Product
3.17%	1.7%	2.82%	Real Disposable Income
1.94%	-1.2%	1.49%	Real Gross Private Investment In All Structures

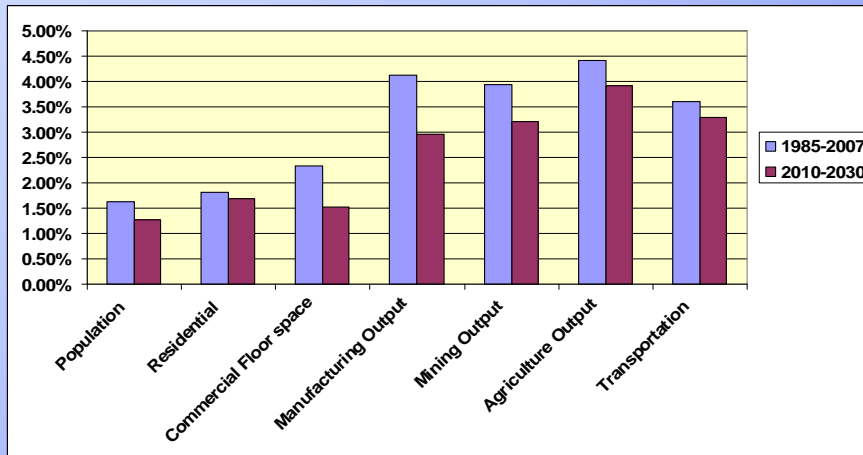
Summary of Regional View

Drivers	1985-2007	2010-2030
Population	1.6%	1.3%
Residential (000's units)	1.8%	1.7%
Commercial Floor space (millions of sqf)	2.3%	1.5%
Manufacturing Output (billions \$2000)	4.1%	3.0%
Mining Output (billions of \$2000)	3.9%	3.2%
Agriculture Output (billions of \$2000)	4.4%	3.9%
Transportation (\$billions of \$2000 income/output)	3.6%	3.3%

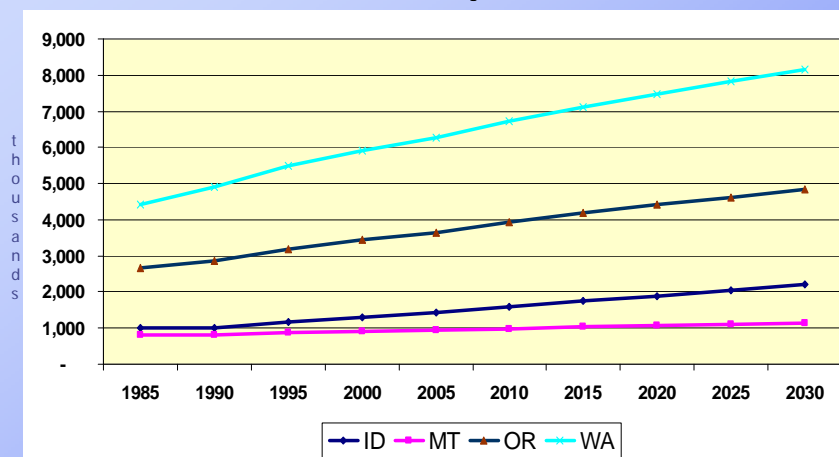
6th Plan's Economic Drivers

- Residential sector - number of homes
- Commercial sector - square footage of buildings
- Mining, agriculture, and industrial sector - dollar value of output
- Transportation sector - sectoral income and number of new cars

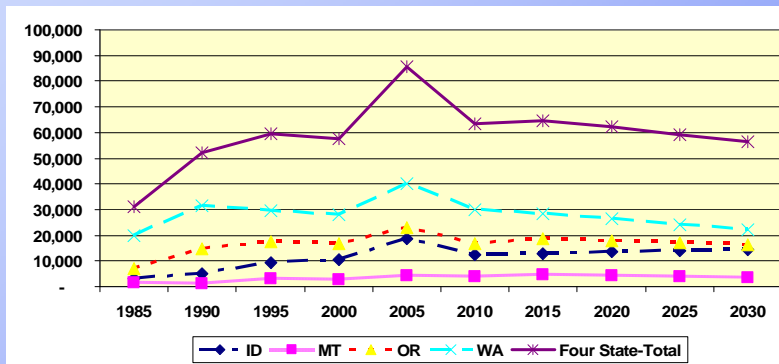
Summary of Growth Rates in 6th Plan's Economic Drivers



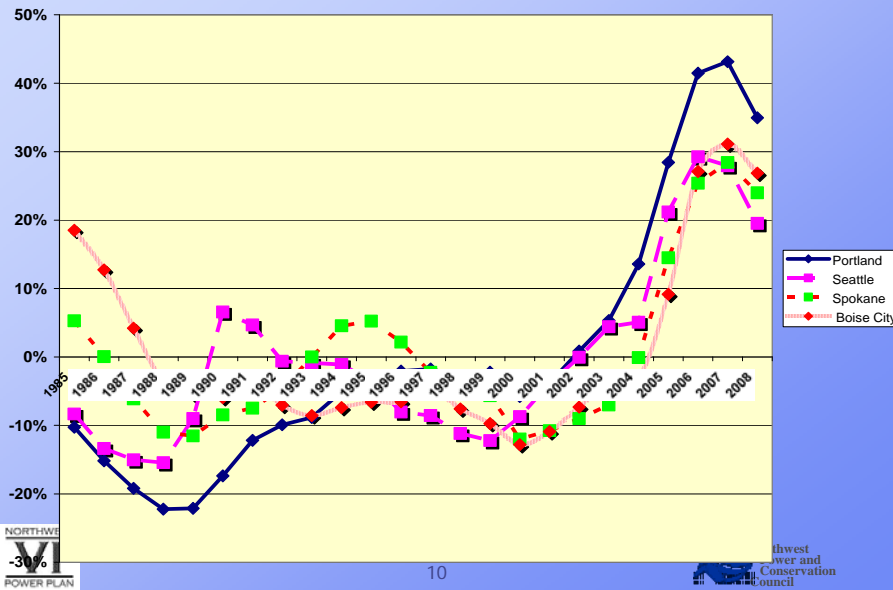
Regional Population is the Primary Driver



New Single Family Additions

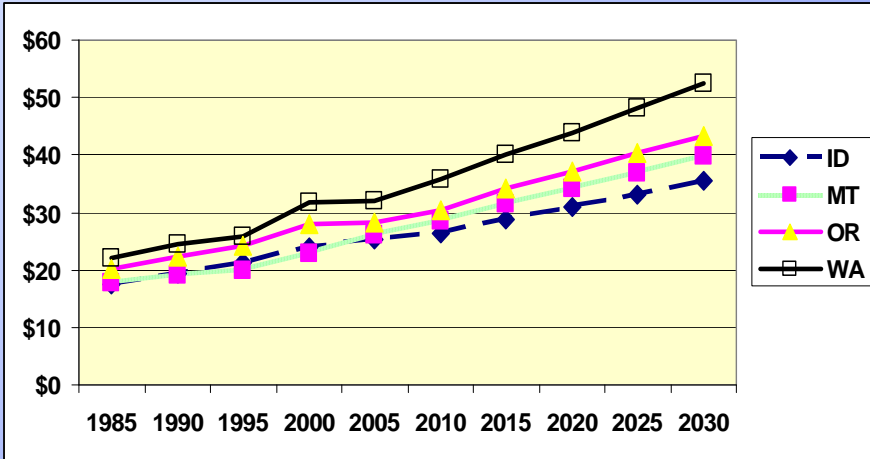


Regional Residential Single Family Housing Value Adjustment continues

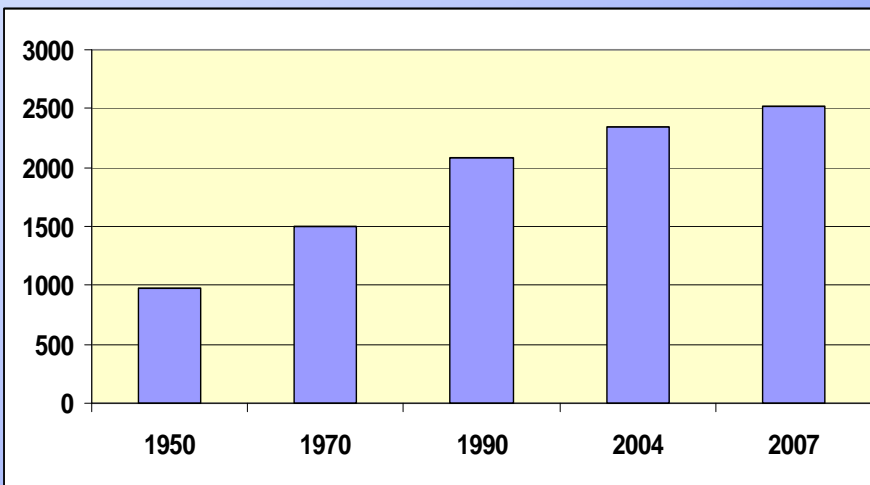


Raising Per Capita Income

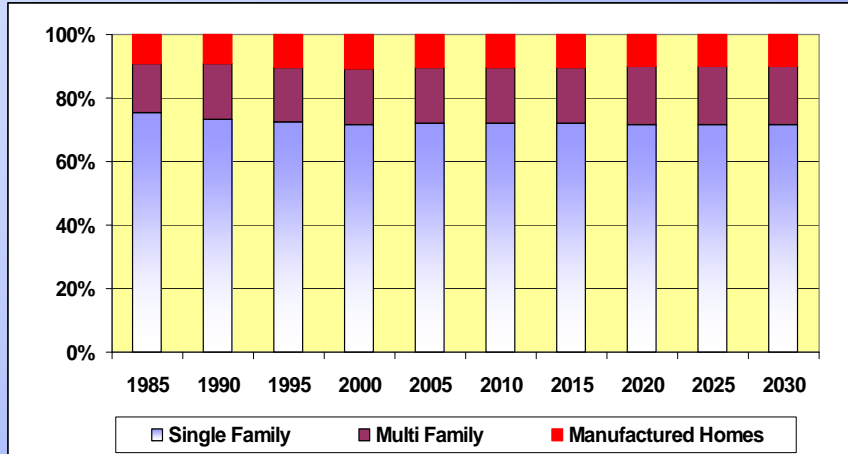
constant \$2000



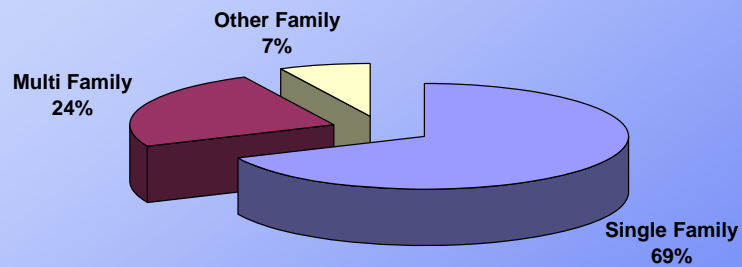
Growing Average Size (SQF) New Single Family Homes



Composition of Regional Housing stock – fairly stable



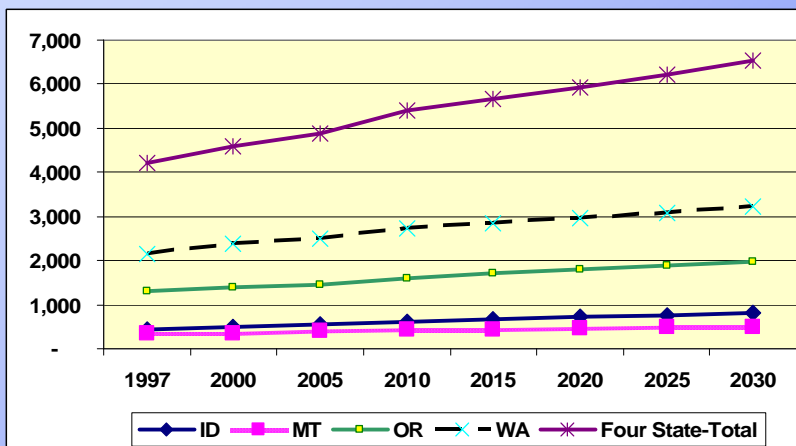
Breakdown of Northwest Residential Electricity Consumption (2005)



Commercial Sector Drivers

- Commercial square footage
 - Commercial square footage is driven by employment
 - Extensive analysis was done to estimate square footage requirement
- Major shifts in employment
- Shift in intensity

Projected Growth in Commercial Employment (in 1000)

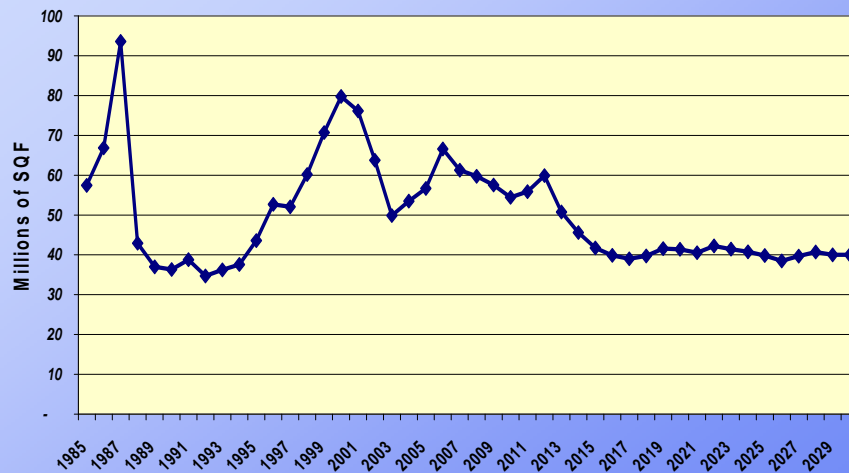


Changing Composition of Commercial Employment

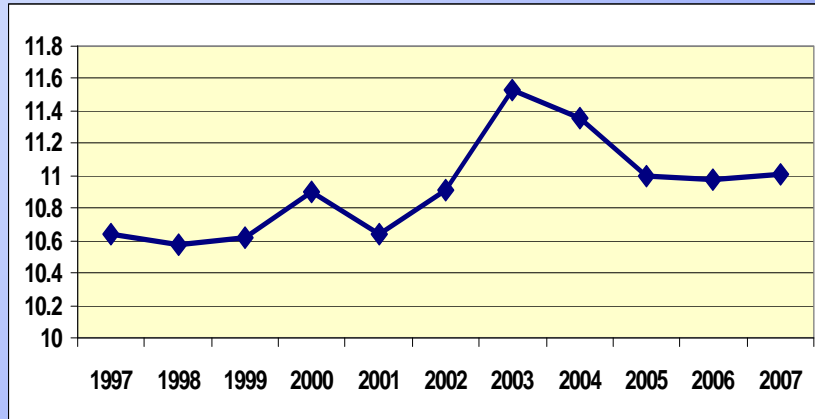
Businesses with Increasing Employment Market Share	1997	2007	2030
Health Care and Social Assistance	10.8%	11.7%	12.5%
Administrative and Support and Waste Management	5.4%	6.1%	9.7%
Information	2.9%	3.1%	3.7%
Construction	6.4%	7.4%	7.8%
Professional, Scientific, and Technical Services	5.1%	5.5%	7.4%
Wholesale Trade	5.5%	5.0%	5.4%
Businesses with Declining or stable Market Share	1997	2007	2030
Government Employees	21.3%	20.0%	18.0%
Retail Trade	13.8%	13.1%	10.7%
Accommodation and Food Services	9.6%	9.4%	7.8%
Transportation and Warehousing	3.9%	3.4%	3.5%
Other Services (except Public Administration)	4.4%	3.9%	3.5%
Finance and Insurance	4.0%	4.1%	3.4%
Real Estate and Rental and Leasing	2.2%	2.2%	1.9%
Arts, Entertainment, and Recreation	1.6%	1.7%	1.7%
Educational Services	1.5%	1.7%	1.6%
Management of Companies and Enterprises	1.4%	1.4%	1.3%
Utilities	0.4%	0.3%	0.2%
Total Employment in Commercial Activities (000)	4,222	5,117	6,531



Commercial Floor Space Additions (Northwest Region)



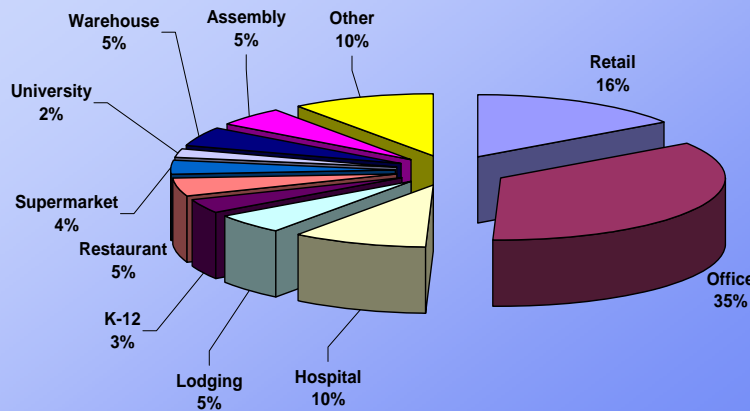
Energy Intensity in Commercial Sector (MWH/employee)



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Breakdown of Electricity Consumption – 4 State Total (2005)



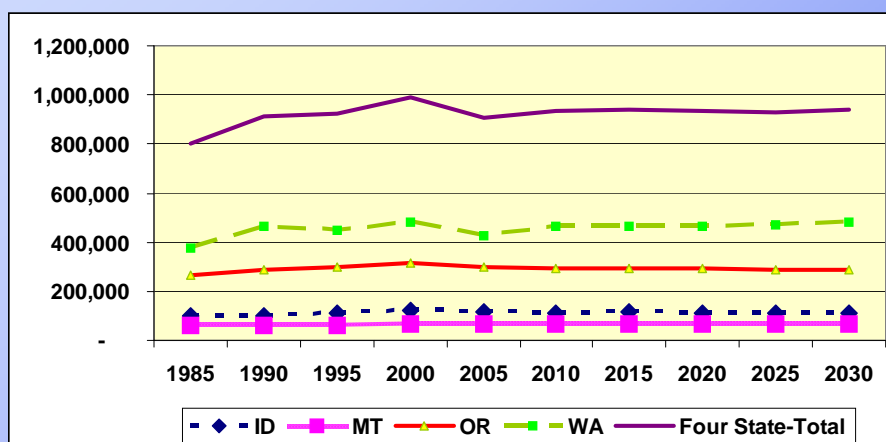
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Economic Drivers of Industrial Sector Demand for Energy

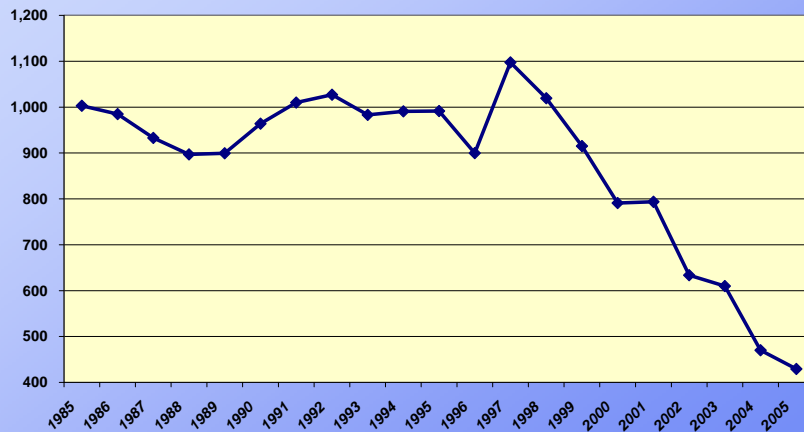
- Sectoral output drives the demand for energy
- Sectoral output grows as employment and productivity in the sector increases
- Employment has been flat
- Productivity has been increasing
- Electricity intensity declining

Projected Employment in Manufacturing



Regional Change in Intensity of Electricity Use – Manufacturing Sector

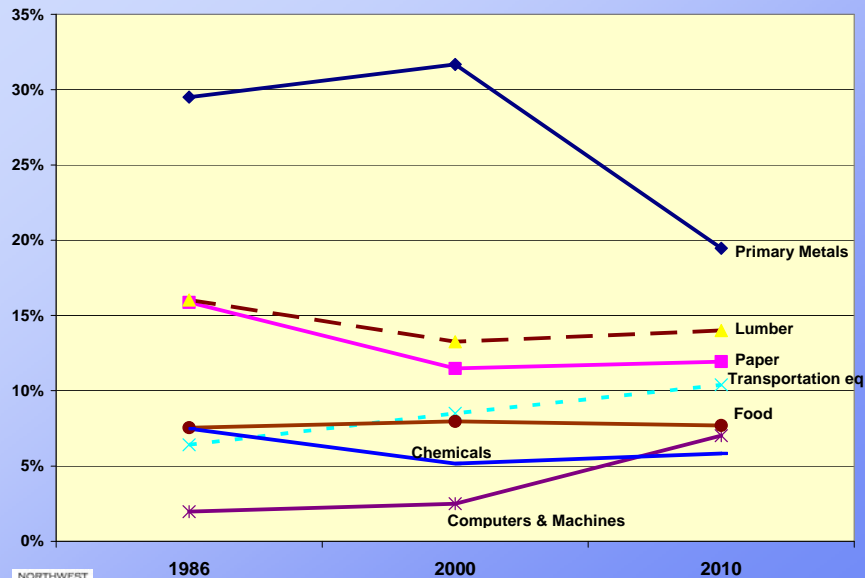
KWH/1000 dollars of output (\$2000)



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Changing Mix of Industrial Electricity Sales



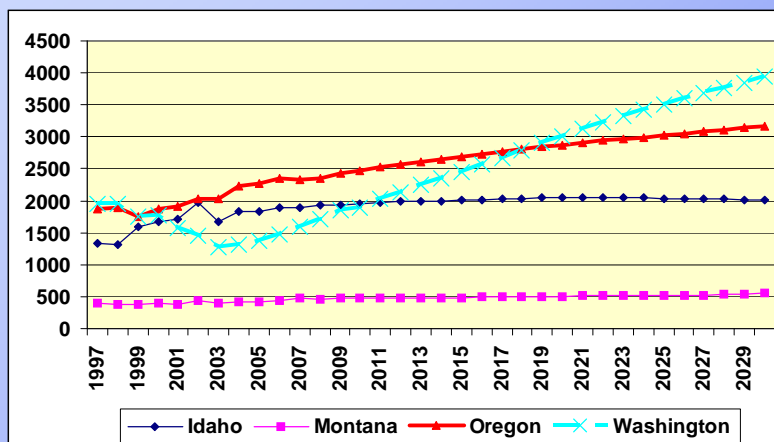
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Economic Drivers of Agricultural Load

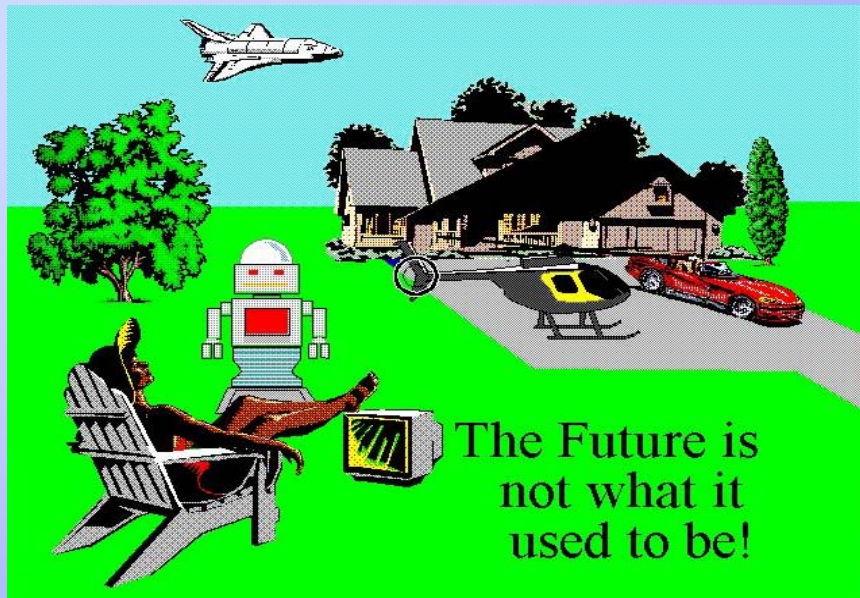
- Agricultural load is driven by supply of irrigated lands
 - Irrigated land is driven by agricultural output
- Demand for dairy products drives demand for dairy cows and milk production

Employment in Dairy Industry



Summary of 6th Plan's Economic Drivers

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The Future is
not what it
used to be!

Scenarios

- Two alternative economic growth trajectories are considered
 - Pessimistic – Slow growth
 - Optimistic – Fast growth
- Each scenario was developed using detailed national level projections from Global Insights October 2008 analysis.



Driving Forces Council's 6th Plan Scenarios

Scenarios and Key Drivers	Base Case	Slow down Scenario	Expansion Scenario
Economy Global, National & Regional	Moderately strong economic	Slow Economic growth	Strong economic growth fueled by green
Climate Change	Some Regional Policies in response to Climate Change	Watered down National and regional actions	Strong public, and business support for green
Fuel Supply and Demand Balance	Moderate fuel price increases. Mix of demand and supply options-consistent with 6 th plan's Medium fuel price scenario	Low fuel price increases. More supply than demand options-consistent with 6 th plan's Low fuel price scenario	Fuel price increases. greater demand side options. options-consistent with 6 th plan's High fuel price scenario



Next Meeting

- Presentation on determinants of retail rates
- Presentation of base and alternative demand forecasts

