



**Climate Change Central**

# **The Impact of Energy Efficiency on the Environment**

**John Rilett**

**Director, Energy Efficiency and Conservation**

Suite 100, 999 - 8th St. SW Calgary, Alberta, Canada  
403-517-2700 | [info@climatechangecentral.com](mailto:info@climatechangecentral.com)  
[www.climatechangecentral.com](http://www.climatechangecentral.com)



# Climate Change Central

- A not-for-profit private-public partnership
- Core staff of 20 in Calgary and Edmonton
- Multi-stakeholder board



## C3's Role

- Work on climate change solutions
- Deliver effective programs
- Take action
- Partner
- Provide innovation
- Align initiatives to Alberta's and the federal government's plans
- Leverage



# Avoiding Environmental Impact via Energy Efficiency

- Greenhouse Gas Emissions
- Criteria Air Contaminants
  - Land use

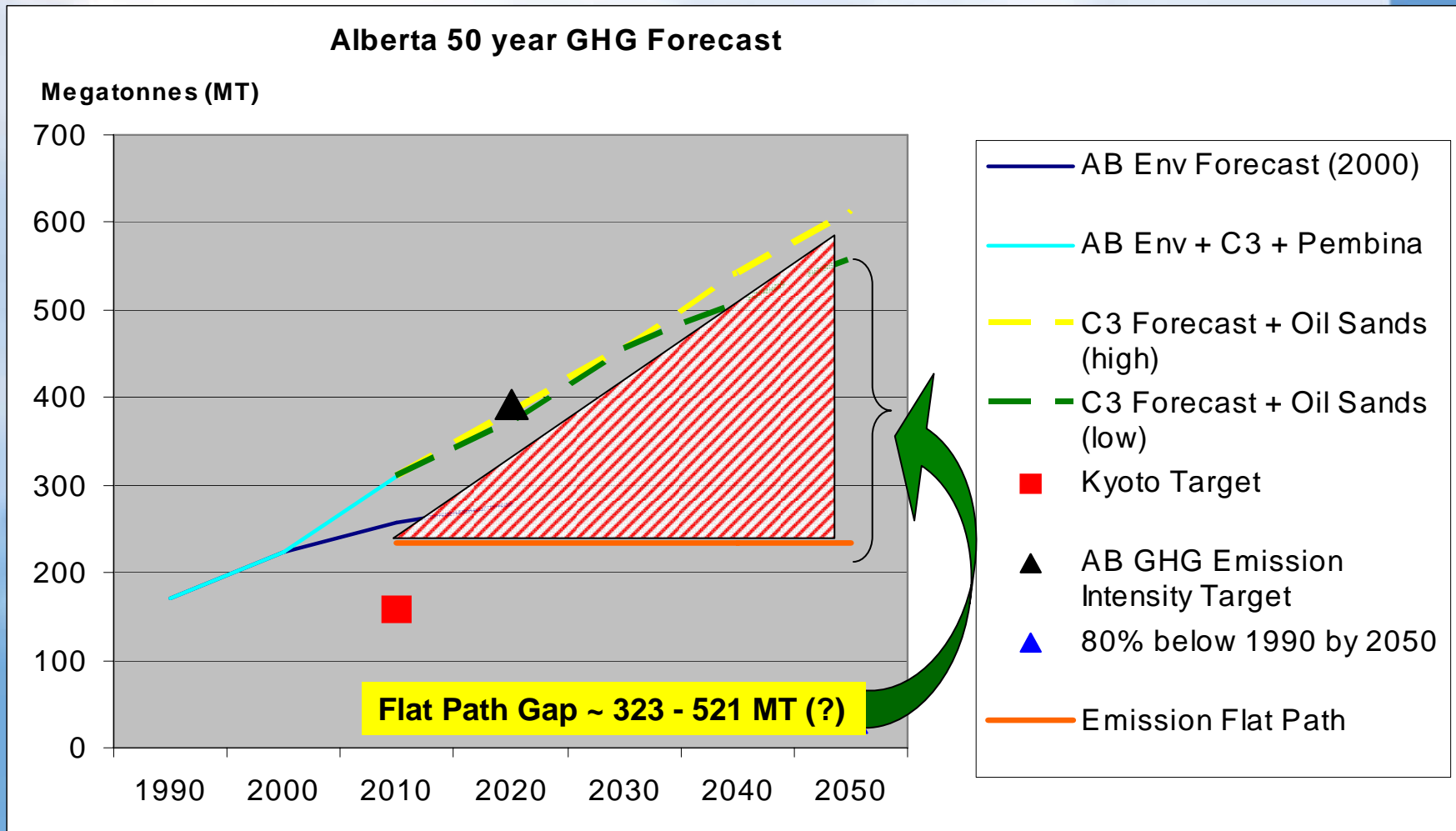


## *Energy Efficiency Benefits*

- Cheap
  - Energy conserved is often the cheapest energy available
- Revenue Enhancement
  - More product to market, lower operating costs
- Helps stretch non-renewable resources
  - Natural Gas, Oil, Coal
- Help integrate renewable energy
  - Wind, solar, biomass
- Tangible role for everyone
  - We all get to play (Industry and Individual)

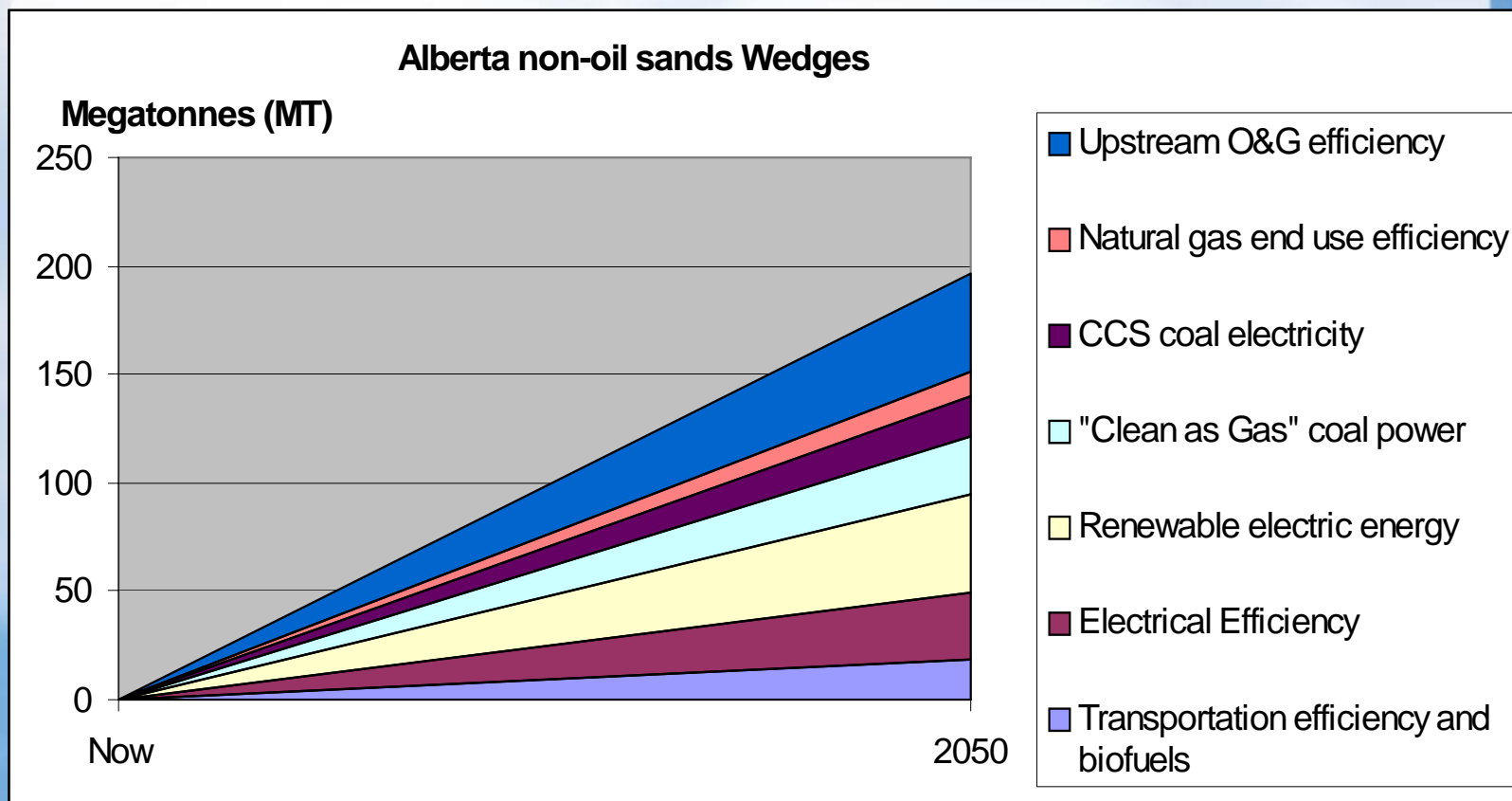


# ALBERTA 50 YEAR GHG FORECAST





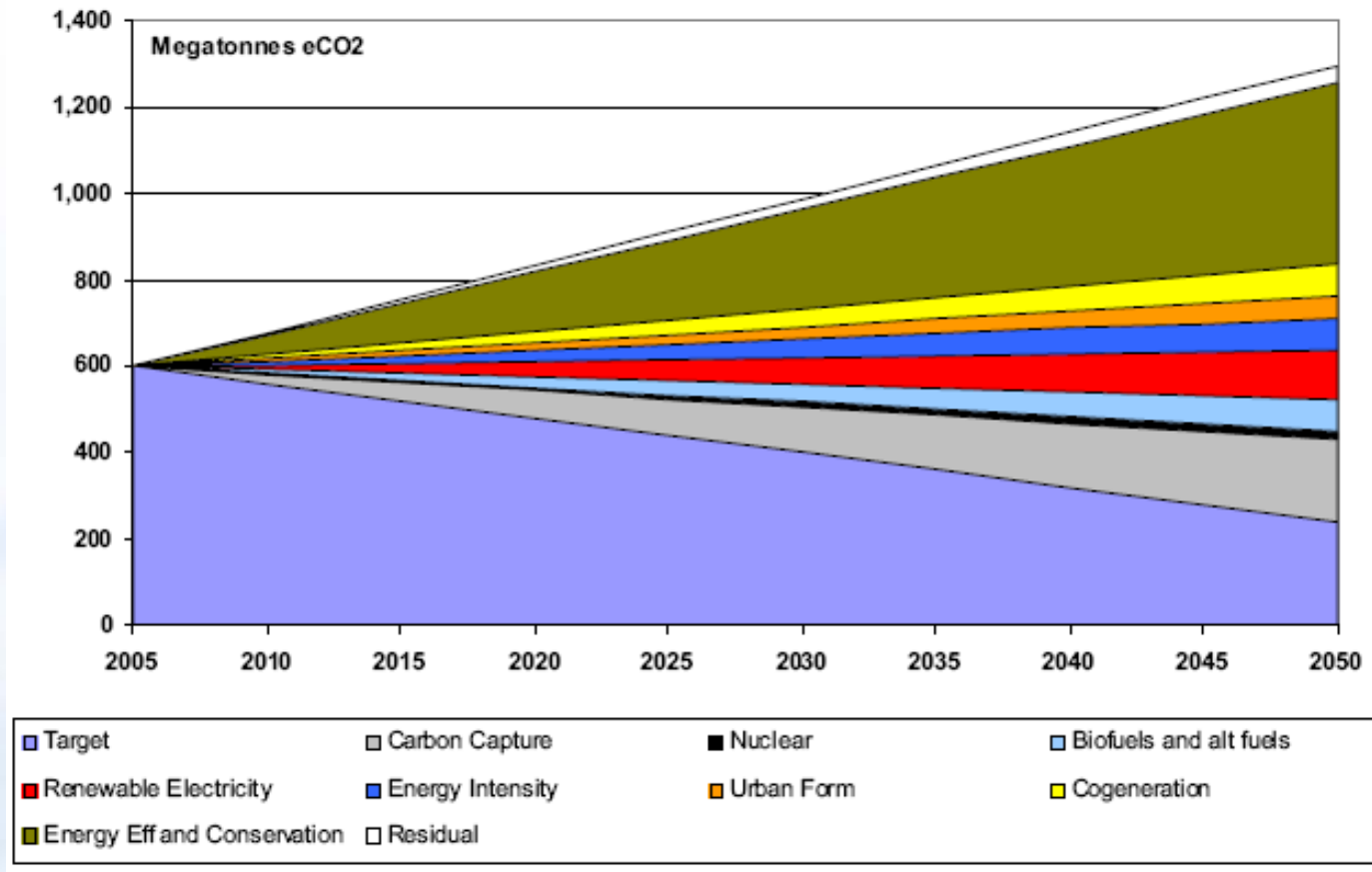
# Alberta Stabilization Wedges



*Disclaimer: All numbers are preliminary and have not been reviewed or finalized.*



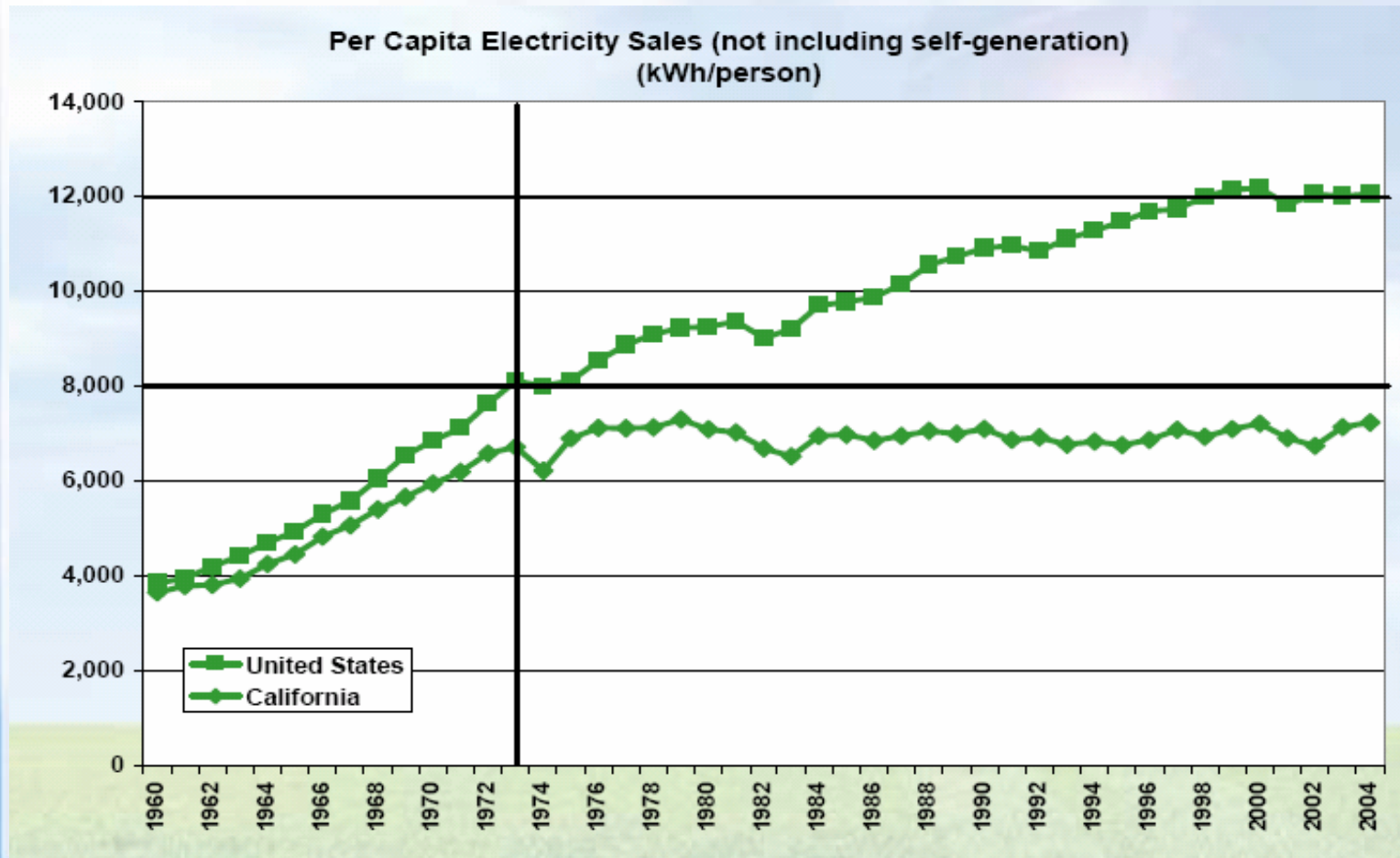
### GHG Reduction Diagram for Canada – Aggregate Wedges



Source: NRTEE



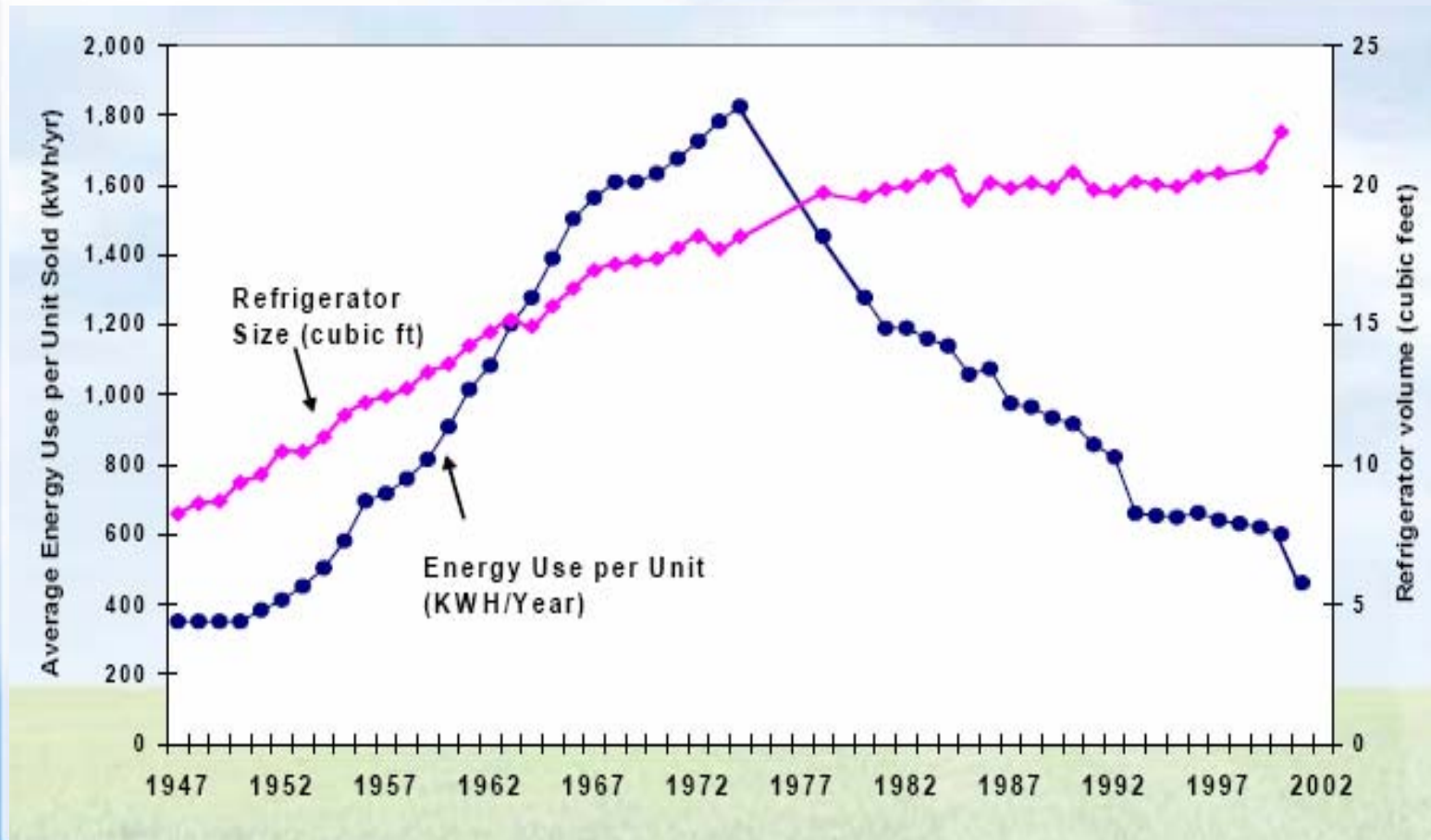
# California



Source: California Energy Commission



# Efficiency vs. Performance



Source: California Energy Commission

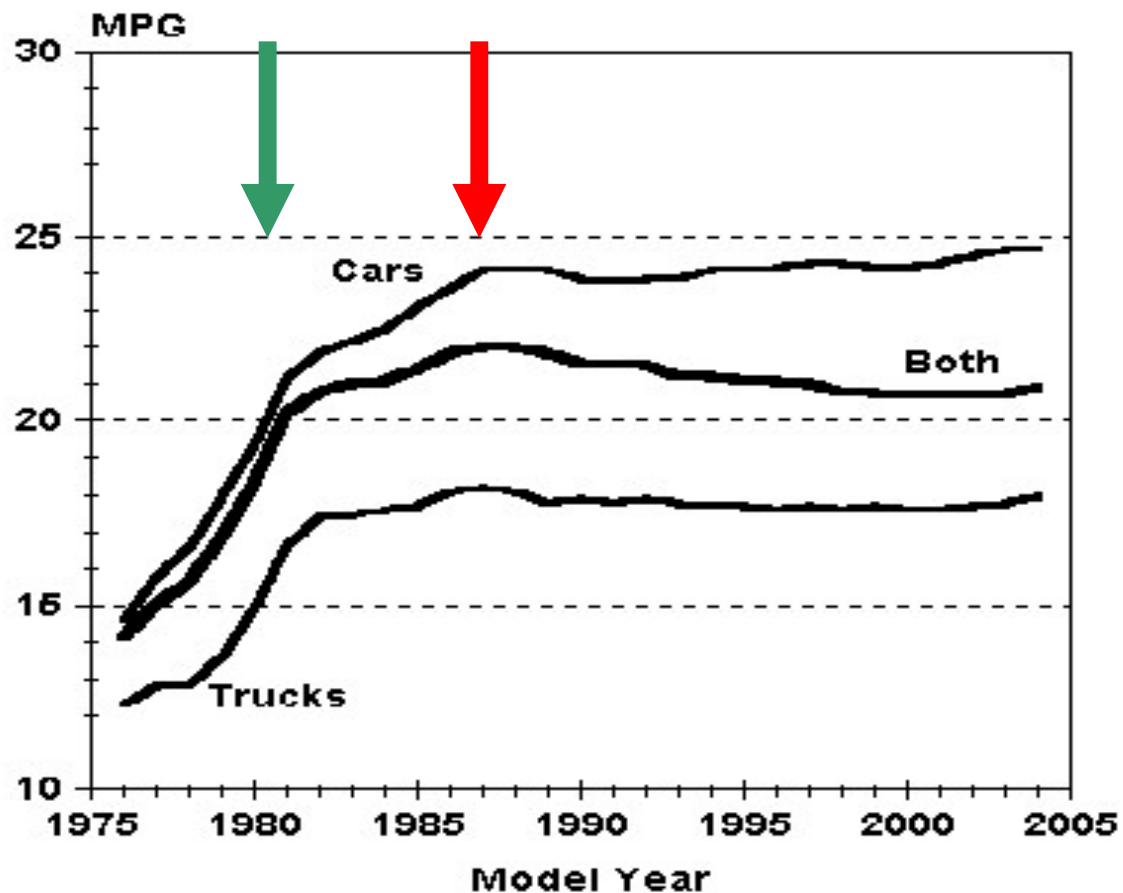


# 2.6 million MW annually!





### Adjusted Fuel Economy by Model Year (Three-Year Moving Average)





# Big Picture Opportunity

- Residential and commercial buildings
- Lighting and Appliances
- Personal Transportation



# Residential Buildings



- 7.4 million new homes built by 2050
- 187,000 each year
- Detached homes 30% more efficient
- Multiple dwelling 60% more efficient
- Annual reduction of 14 Mt CO<sub>2</sub>e



# Home Renovations



- 90% of homes in Canada to be retrofitted by 2050
- This means 165,000/year
- 30% more efficient on average
- Annual reduction of 13 Mt CO<sub>2</sub>e



# Commercial Buildings

- New buildings meet LEED Platinum standard
- 60% reduction in energy use
- Annual reduction of 13 Mt CO<sub>2</sub>e



## Commercial Buildings - Retrofit

- 50% are retrofitted to reduce energy use by 25%
- 50% retrofitted to LEED Platinum = 50% reduction
- Annual Reduction of 14 Mt CO<sub>2</sub>e





## Lighting and Appliances - Residential

- Residential lighting energy use reduced by 60% - 75%
- Appliances 20% - 25% more efficient
- Annual reduction of 6 Mt CO<sub>2</sub>e



Source: NRTEE



## Lighting and Equipment - Commercial



- Lighting efficiency improved by 50% (T8 lights, electronic ballasts, sensors)
- Auxiliary motors 20% more efficient
- Cooling reduced by 30%
- Annual reduction of 11 Mt CO<sub>2</sub>e



## Personal Transportation

- Goal of 3.0L/100km fleet average by 2050
- Current average is 11L/100km
- Annual reduction of 14 Mt CO<sub>2</sub>e



Source: NRTEE





# The Negawatt concept

- Look for opportunity to reduce consumption instead of increasing production
- Value efficiency



# Ontario



- Has promoted DSM for years
- Recently contracted for 25 MW (NW)
- Managed by EnerNOC Inc.
- Large users are centrally controlled and power consumption is reduced at peak times
- More than 1,100 MW included in this type of system in New England States



## ISO New England

- RFP for power to New England states
- 1,814 MW proposed
- 1,188 MW demand side management, 626 MW new generation
- Efficiency was able to compete in the open market against new production



**Climate Change Central**

# The individual

## How large is the sum of our parts?



## Alberta House



- Average house = 12 tonnes CO<sub>2</sub>
- 7,000 kWh (32% lighting, 30% refrigeration)
- 135 GJ of natural gas (space heating 80%, water heating 20%)



# Residential Heating



- What if all home heating in Alberta was Energy Star?
  - 24 million GJs in savings
  - 1.2 MT of GHG emissions avoided annually
  - \$144 million in annual savings to consumers



**Climate Change Central**

# The Corporation

How big can this get?



## ADOBE Inc.



- Investigated energy efficiency in response to California energy crisis
- 64 initiatives costing \$1.4 Million
- Electricity down 35%, Natural Gas down 41%
- Annual savings \$1.2 Million
- Return on investment 121%

Source: Globe and Mail , April 1, 2008



# Alberta's Path

- Throne Speech
  - Commitment to make Alberta more Energy Efficient
- 2008 Climate Change Strategy
  - 24 MT reduction from energy efficiency and conservation



**Climate Change Central**

Every Action Counts

It's time to take action!

Suite 100, 999 - 8th St. SW Calgary, Alberta, Canada  
403-517-2700 | [info@climatechangecentral.com](mailto:info@climatechangecentral.com)  
[www.climatechangecentral.com](http://www.climatechangecentral.com)



**Climate Change Central**

# Contact Information

John Rilett

[jrilett@climatechangecentral.com](mailto:jrilett@climatechangecentral.com)

403-517-2700

Suite 100, 999 - 8th St. SW Calgary, Alberta, Canada  
403-517-2700 | [info@climatechangecentral.com](mailto:info@climatechangecentral.com)  
[www.climatechangecentral.com](http://www.climatechangecentral.com)