APEC Energy Supply and Demand Outlook

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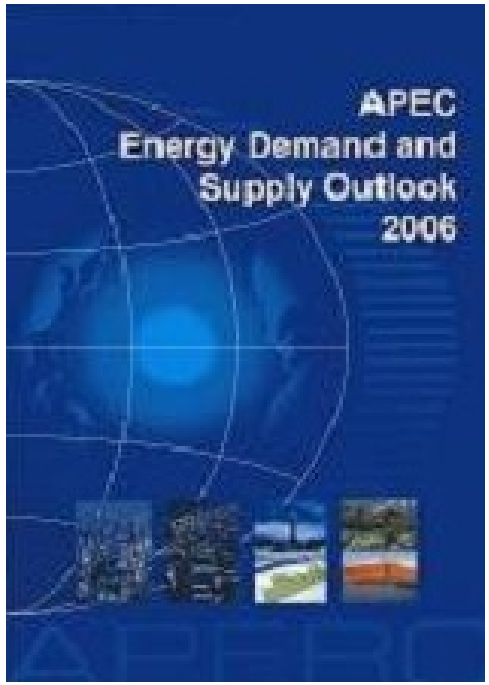
Overview

- Background on the Outlook
- Assumed Key Assumptions and Trends
- Expected Key Conclusions
- Discussion

Background on the Outlook



- Long-term (to 2030) perspective on APEC energy Demand and Supply
- Summarizes wide range of energy issues in all APEC economies
- Relies heavily on advice and feedback from APEC government experts
- Three previous editions, last one in 2006

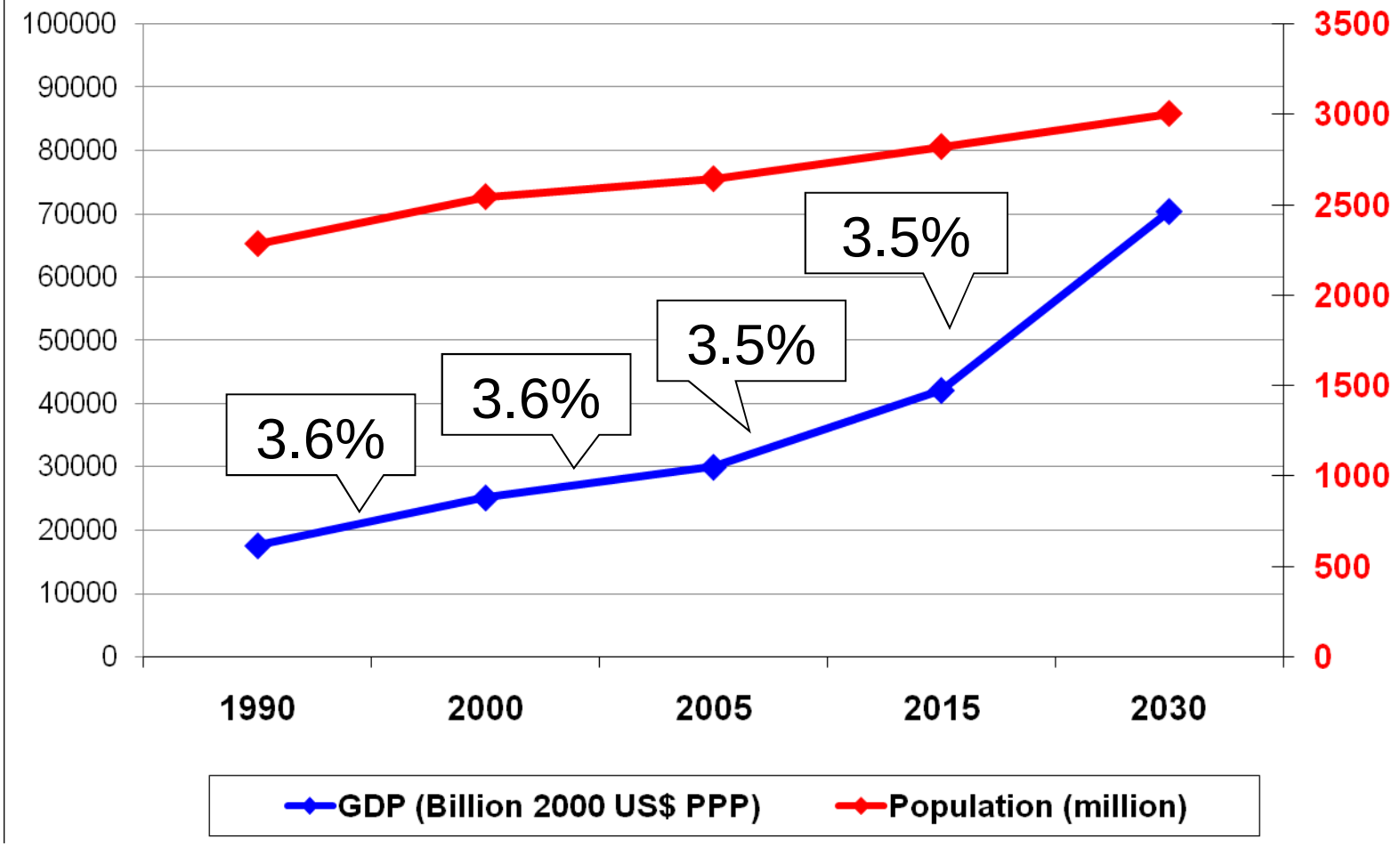
Project Scheduling Goals

- Model results ready for outside review: EWG Meeting and APERC Workshop, Chile, 20-23 April 2009
- Draft document ready for outside review: June 2009
- Document published: early August 2009

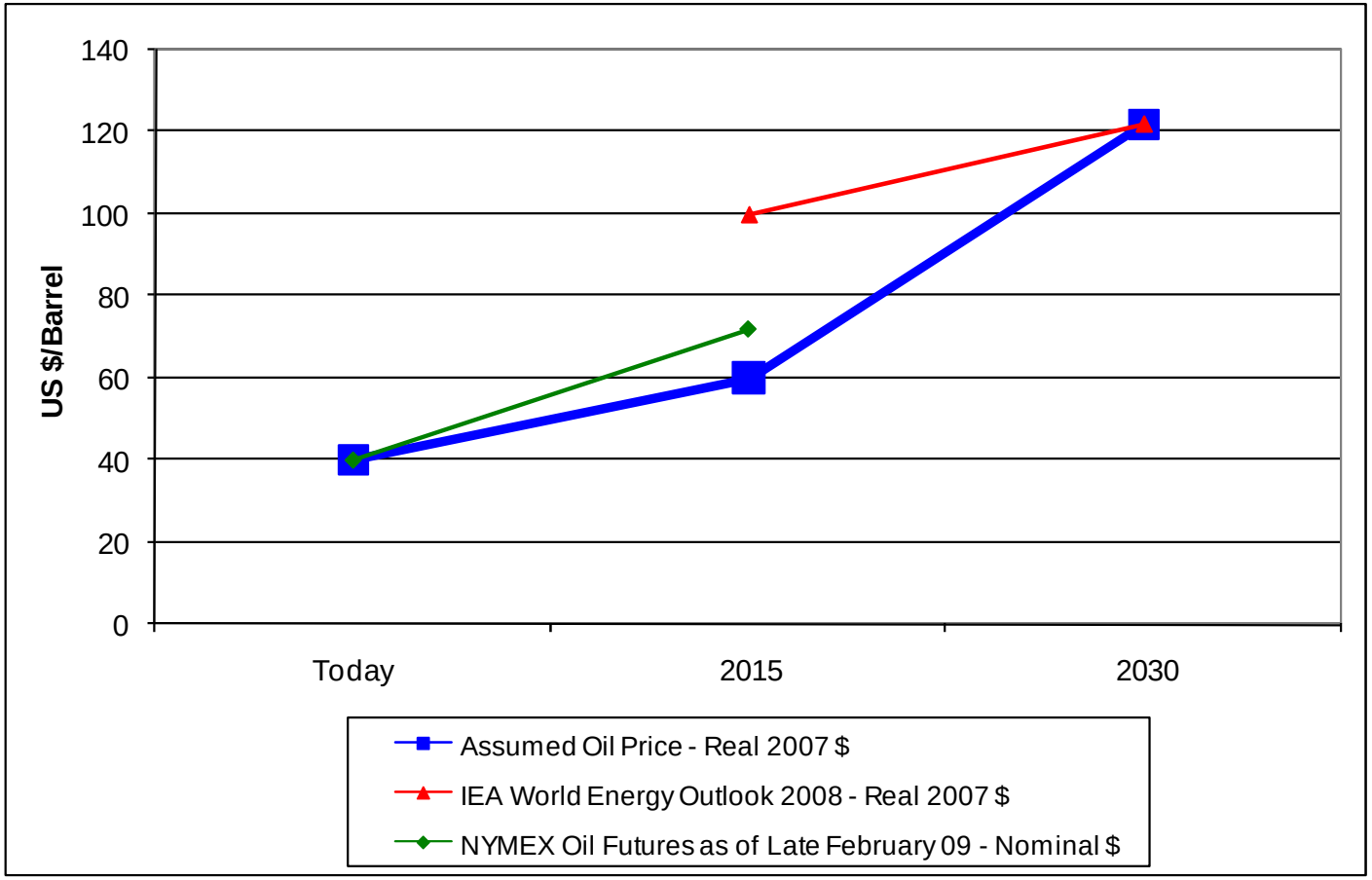
Assumed Key Driving Trends

- Despite recent economic crisis, continued economic growth and progress over the long-term, especially in developing economies
  - Shift to commercial fuels and electrification
  - Motorization
  - This is a good thing, especially for millions of people who will be lifted out of poverty
  - But it does pose some significant energy challenges
- Oil prices remain moderate, at least on average

Assumed GDP and Population



Assumed Oil Prices

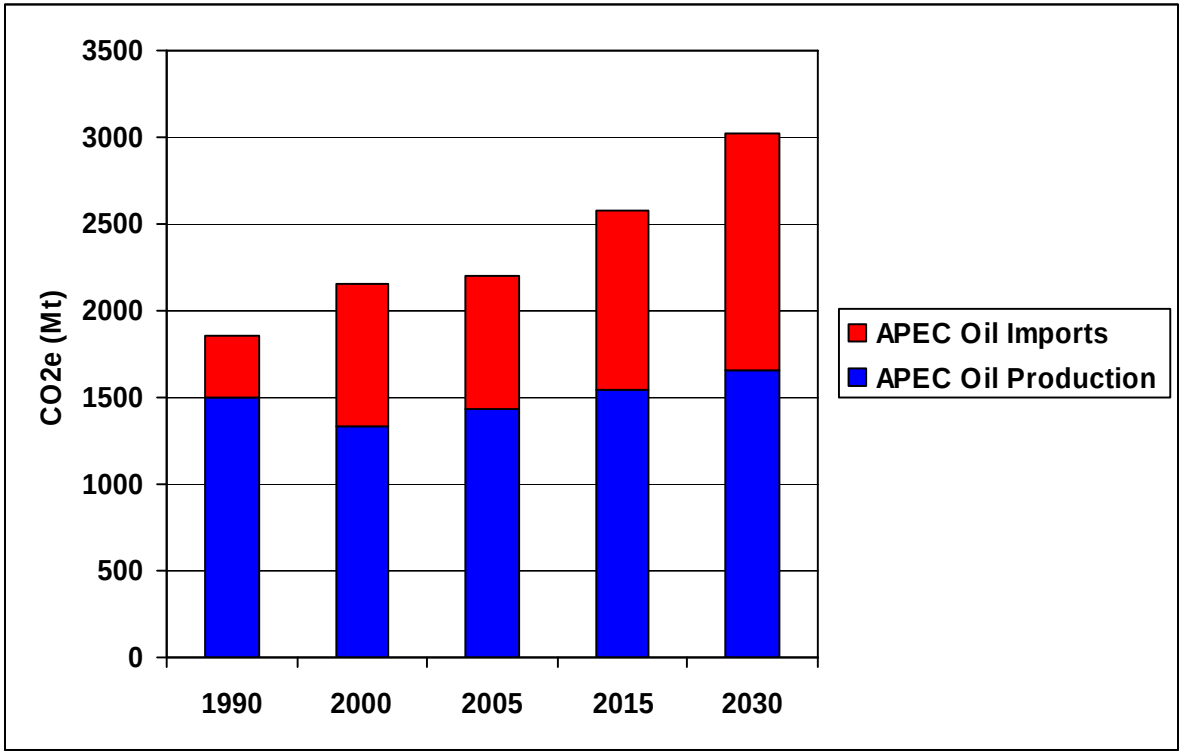


Business-As-Usual Assumption

- Energy policies of APEC governments changing rapidly
  - Economic crisis response
  - Oil security response
  - Climate change response
- *Clearly, the future will not be business-as-usual*
- Yet, business-as-usual can still provide a key benchmark for analyzing any future changes
- Definition of Business-As-Usual (BAU):
  - Includes policies already being implemented
  - Does *not* include ‘targets’, ‘goals’, or policies governments may have announced unless their implementation is certain and well defined

Expected Conclusion #1: Oil Security

APEC Region Will Be Increasingly Dependent on Middle East/African Oil



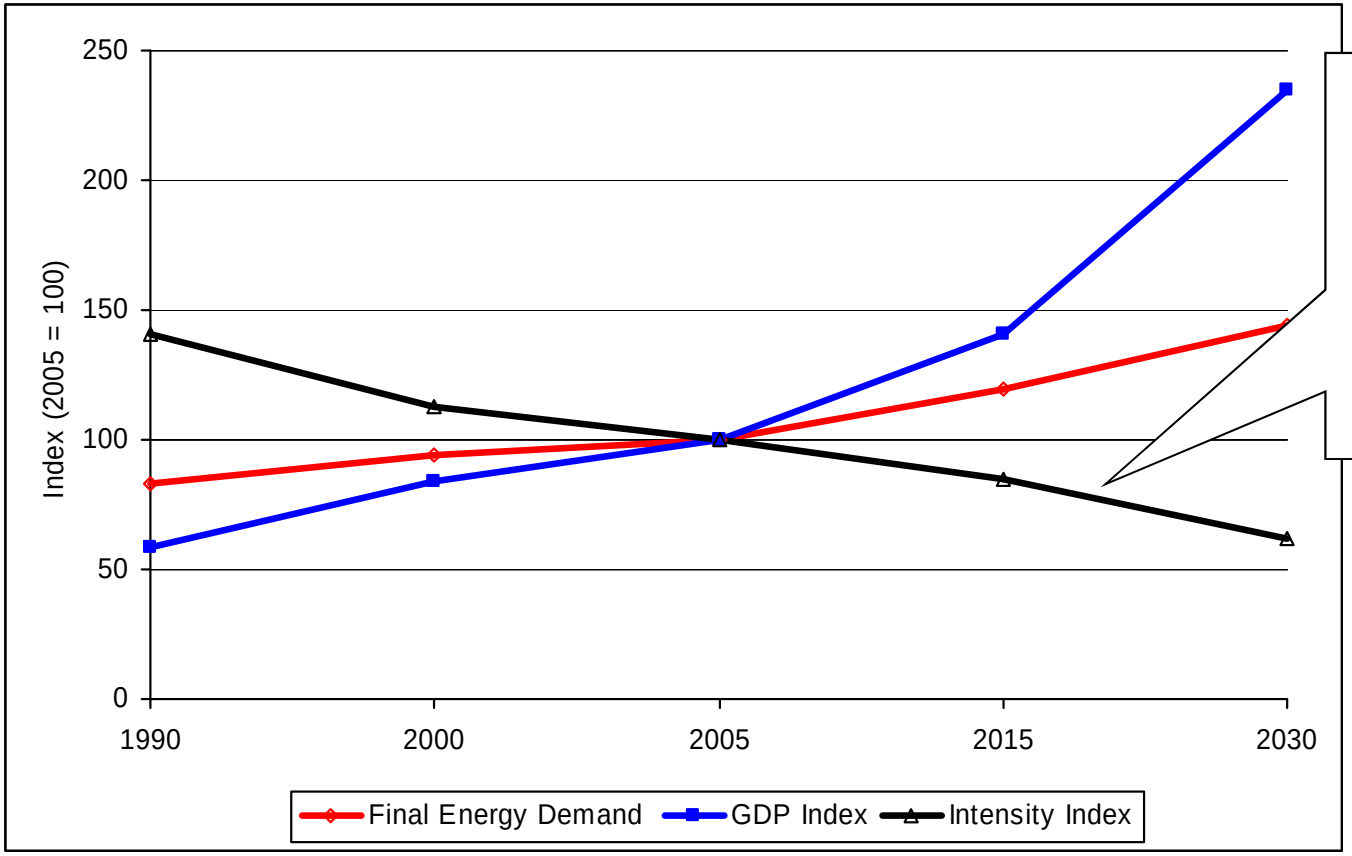
Implications of Import Dependency

- Oil import dependency implies:
  - Dependence upon political events in other regions, such as the Middle East and Africa
  - Dependence upon national oil companies and multi-national oil companies to make adequate investments
  - Oil prices increasingly influenced by market power of producing countries
  - Dependence upon secure transport from the Middle East and Africa
- Likely Outcomes:
  - Continued oil price volatility a near certainty
  - Significant risks of supply disruptions
  - Both of the above threaten the economic stability of the APEC economies and the world

Expected Conclusion #2: The Economic Crisis

- Current economic crisis increases risk of inadequate investment in energy infrastructure
  - Could threaten security of supply and price stability as the economy recovers
- Governments are working together to unlock financial markets
- A positive side-effect of government intervention may be to direct energy investment in more secure and environmentally-friendly sources

Expected Key Conclusion #3: Minimum APEC Intensity Goals Will Be Met Under BAU



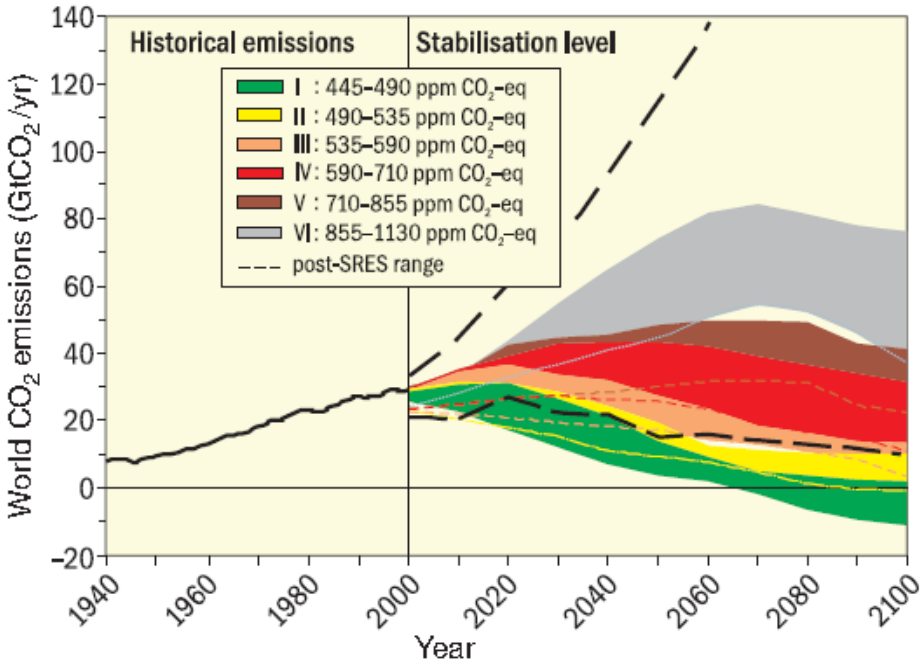
Intensity down more than 25% compared to 2005

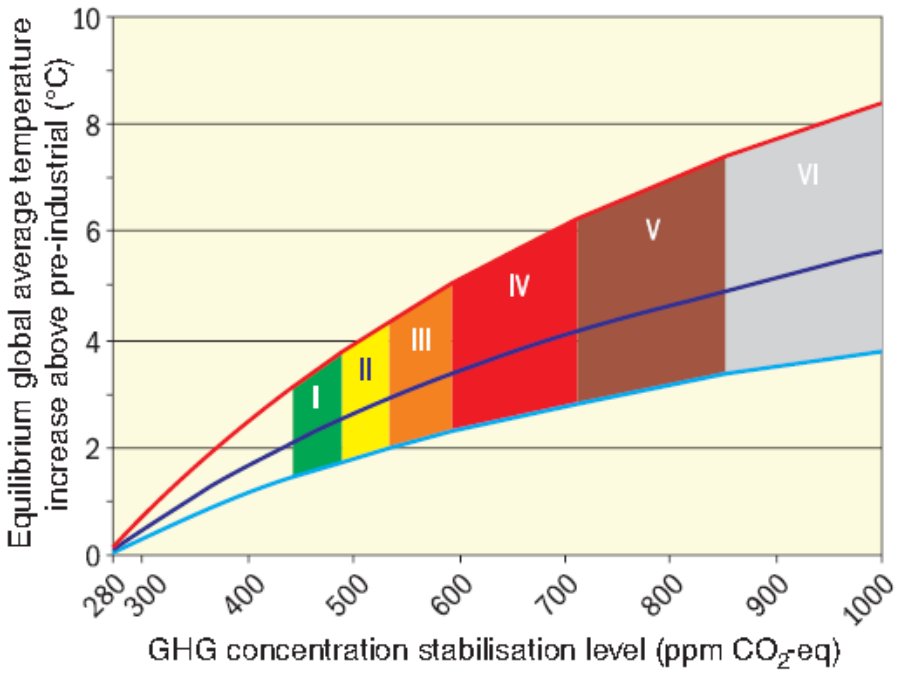
Expected Key Conclusion #4: BAU is Still Environmentally Unsustainable

- The best science says that the path we are on has a great probability of disastrous climate change consequences
- Graph on the following slide illustrates the dilemma (Taken from the IPCC *Fourth Assessment Report; Synthesis Report, 2007,* p.66)

Emissions vs. Temperature Rise

CO_2 emissions and equilibrium temperature increases for a range of stabilisation levels

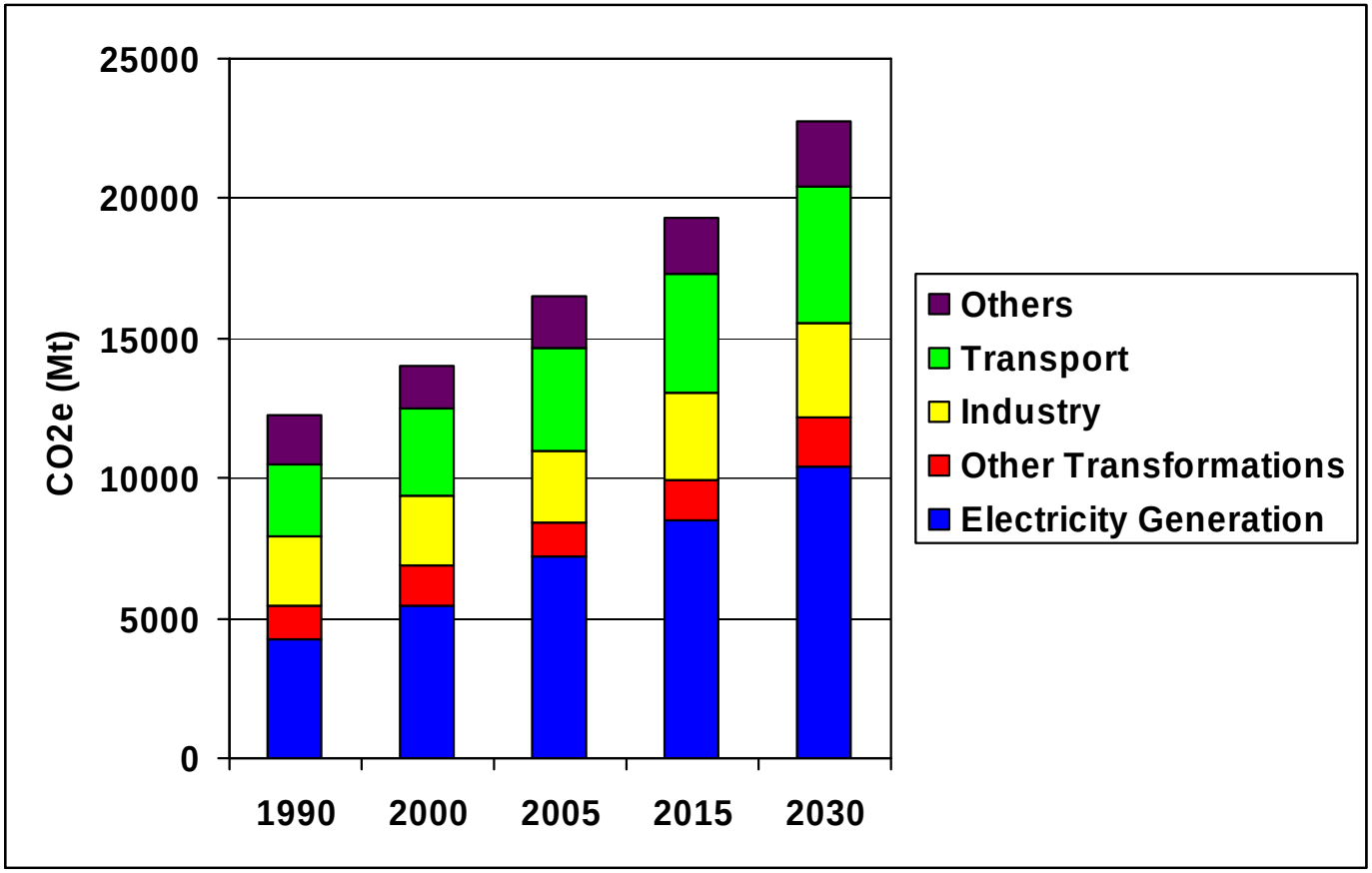




What Happens If CO2e>450-535 ppm?

- Rising in sea level
- Damage to coral reefs and fish stocks
- Melting glaciers
- Droughts and heat
- Severe weather
- Spread of tropical diseases and pests
- Mass extinctions of wildlife
- Risk of ‘positive feedbacks’ making things even worse

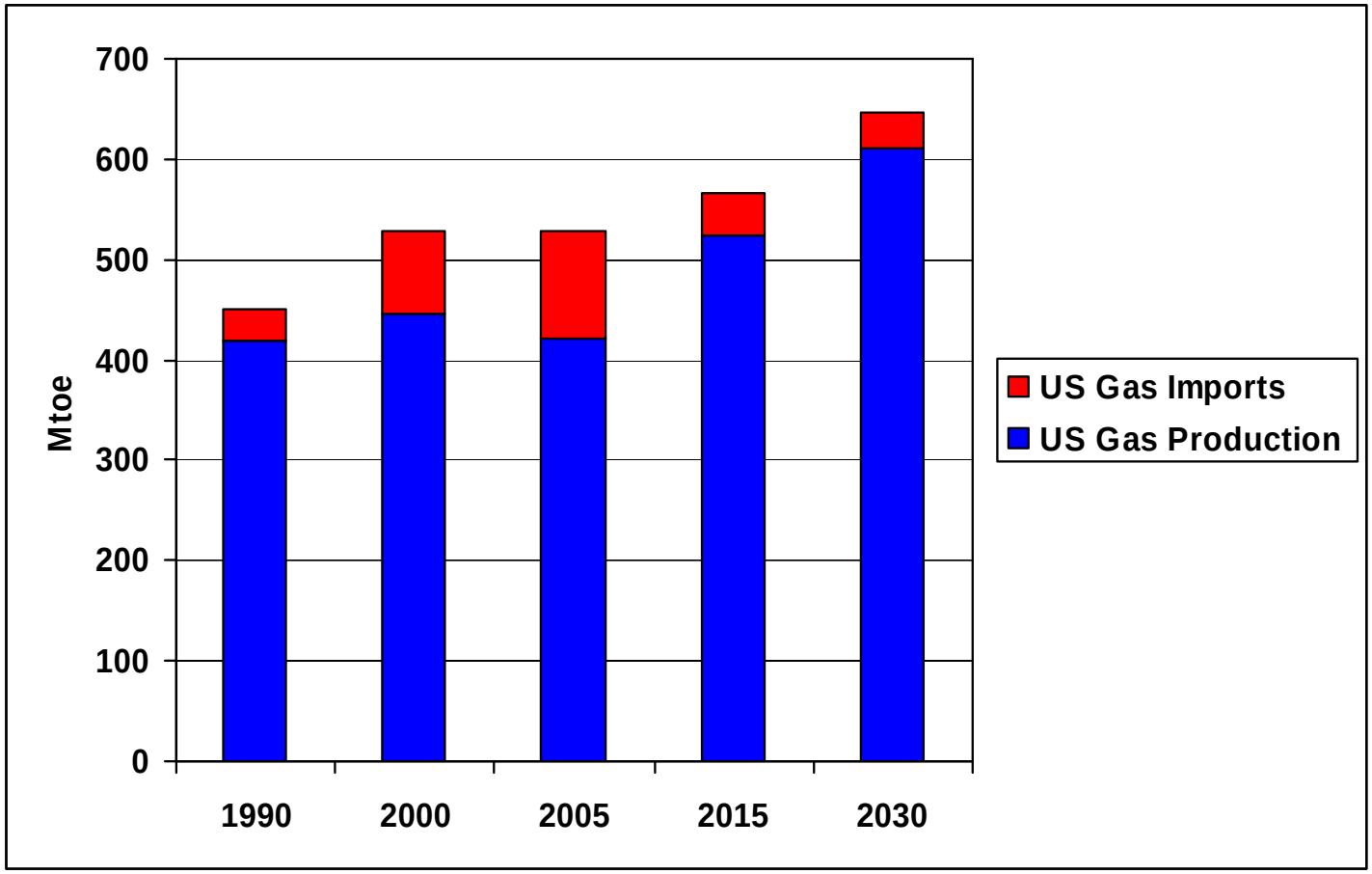
APEC Greenhouse Gas Emissions



Expected Conclusion #5: Unconventional Gas

- New technology for unconventional gas development has reversed decline of gas production in U.S.
  - U.S. no longer likely to be large LNG importer
  - Frees up LNG supplies for other economies
  - Reduces need for LNG imports from outside APEC, such as the Middle East and Africa
- Technology could be applied elsewhere, allowing more domestic gas production throughout the APEC region
  - Could help reduce coal use in power generation

US Gas Production and Imports



Expected Conclusion #6: Push for Sustainability

- Many APEC governments are greatly expanding efforts to promote energy efficiency and low-carbon energy
- Examples:
  - China: 11th Plan for Economic and Social Development
  - Japan: “Top Runner”
  - USA: “Green New Deal”
- But more effort will still be needed for a more secure and sustainable future
- APEC/APERC Peer Reviews of Energy Efficiency (PREE) expected to help make these efforts more effective

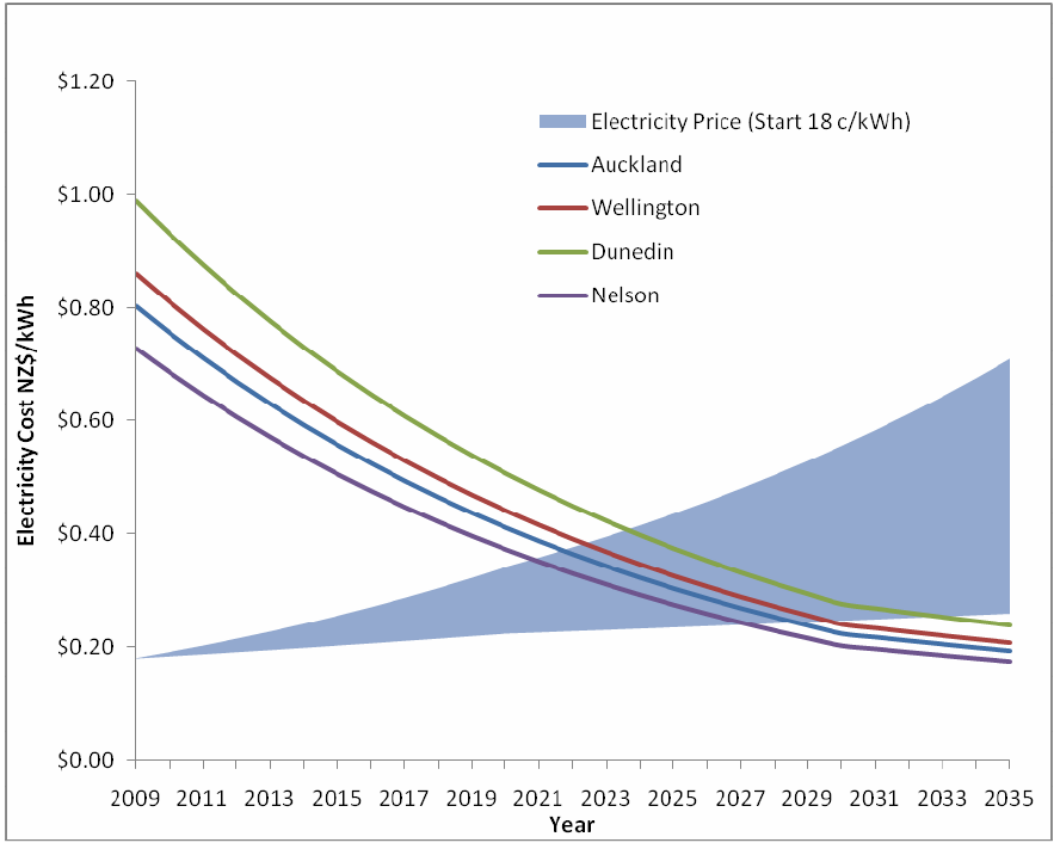
Push for Sustainability Example: China

- China's energy efficiency efforts the subject of two APERC studies
  - 11th Plan for Economic and Social Development: 20% reduction in energy intensity (TPES/GDP) from 2006 to 2010
  - Backed-up with a comprehensive set of policies as well as commitments by regional governments and enterprises
  - Similar goals under consideration post-2010
- Big push for renewable and nuclear energy as well

Expected Conclusion #7: New Technologies

- Potential of new technologies often underestimated
- Example: Solar photovoltaics (PV) has historically been expensive and uncompetitive with fossil fuels, but
  - It is declining rapidly in cost
  - Given that it is a semiconductor-based technology, these cost declines are likely to continue
  - Only needs to compete with the retail electricity price
- Solar PV now attracting large private sector investments
  - Venture capital and established companies
  - China becoming a big player
- If successful, solar PV could be a renewable electricity source available almost anywhere in almost unlimited quantities
- Keys to success:
  - Supportive regulatory policies
  - Supportive policies for new technology and entrepreneurship

Projected Cost of Solar PV in New Zealand



Source: IT Power Australia Ltd. and Southern Perspectives Pty Ltd., *Assessment of the Future Costs and Performance of Solar Photovoltaic Technologies in New Zealand,* April 2009.

Discussion

- Questions and Comments?