

Energy Efficiency and Arizona's Energy Future



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Southwest Energy Efficiency Project (SWEEP)

Comments: Tucson Electric Power Company (TEP)
October 22, 2009



Southwest Energy Efficiency Project (SWEEP)

- ❑ Public interest initiative promoting greater energy efficiency in AZ and southwest states
- ❑ Founded in 2001
- ❑ Board of Directors includes utility, state government, national laboratory, and private sector representatives
- ❑ Funding provided by the Energy Foundation, Hewlett Foundation, U.S. Department of Energy, and the U.S. Environmental Protection Agency

www.swenergy.org

Clean and Sustainable Energy

- ❑ Renewable energy
 - Distributed (on homes and businesses)
 - Central plant/CSP/wind farms
- ❑ Energy efficiency
 - Demand-side management (DSM) programs, building codes, appliance standards
- ❑ Clean distributed generation (CHP)
- ❑ Goals and portfolio standards
- ❑ The near future – carbon regulation, transportation (plug in hybrids, other vehicles, other)?



Benefits of Energy Efficiency

- Energy efficiency is good for:
 - Customers (consumers and businesses)
 - The utility system (electric and gas)
 - The economy
 - The environment



Energy Efficiency...

- ❑ Is the lowest cost energy resource – only 2 to 3 cents per kWh saved
- ❑ Can reduce customers' energy bills by 10% to 50%
- ❑ Would create over 12,000 new jobs in Arizona by 2025
- ❑ Would keep more of the energy economy in Arizona (currently, \$9.9 billion of the \$14.5 billion that Arizona businesses and consumers spend on energy leaves the state each year)
- ❑ Is a direct and “no regrets” way to reduce air pollution and greenhouse gas emissions

Benefits of Energy Efficiency

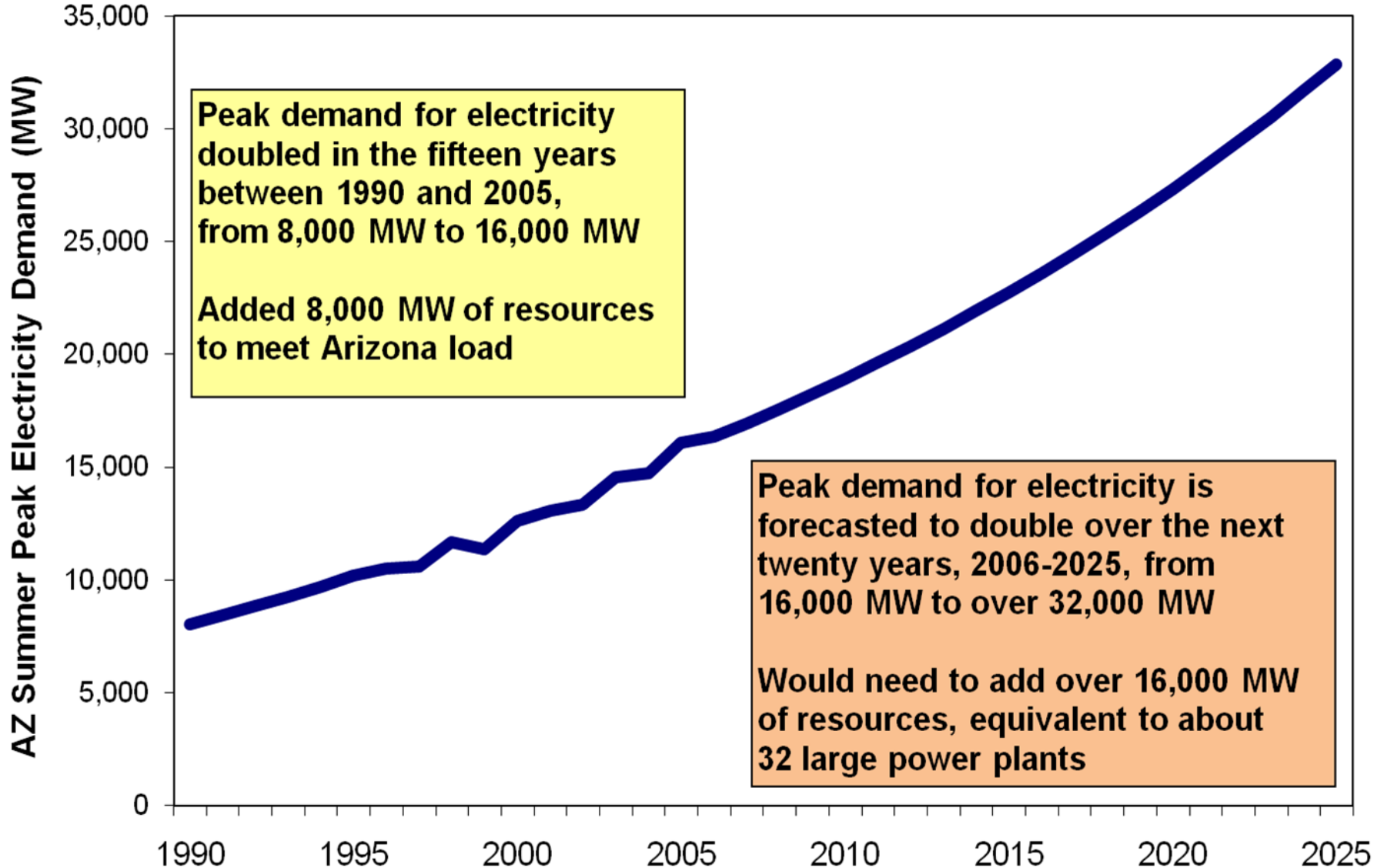
- ❑ Electric sector and natural gas benefits:
 - Avoided investment in power plants and T&D
 - Reduced fuel, operating, and purchased power costs
 - Reduced natural gas prices
- ❑ Customers: lower total costs, other direct benefits
- ❑ Reliability: increased diversity, increase in distributed resources, and reduced risk of power outages
- ❑ Prices: reduced price volatility, reduced price spikes
- ❑ Macroeconomic benefits: jobs, income
- ❑ Environmental benefits:
 - Reduced water consumption
 - Reduced air pollution and carbon/GHG emissions

Western Governors' Association (WGA) Energy Efficiency Task Force Report

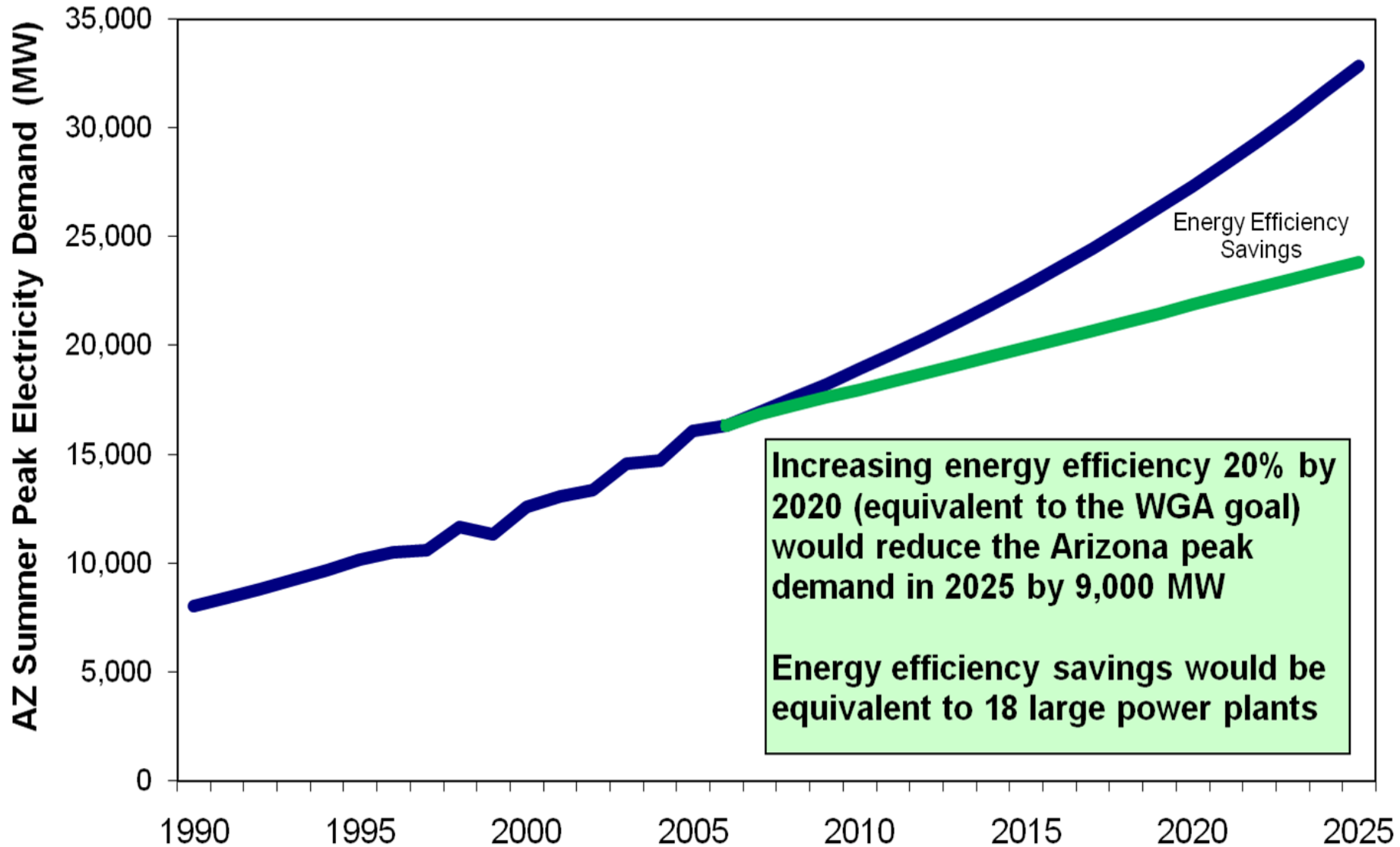
Potential Impact of Energy Efficiency

- It is feasible to reduce electricity use 20% by 2020 relative to business-as-usual forecasts
- Achieving this goal in the 18 western states would provide:
 - 48,000 MW of avoided power plant construction
 - \$53 billion in net economic benefits for consumers and businesses
 - 1.8 trillion gallons of water savings
 - Substantial reduction in power plant CO₂ emissions

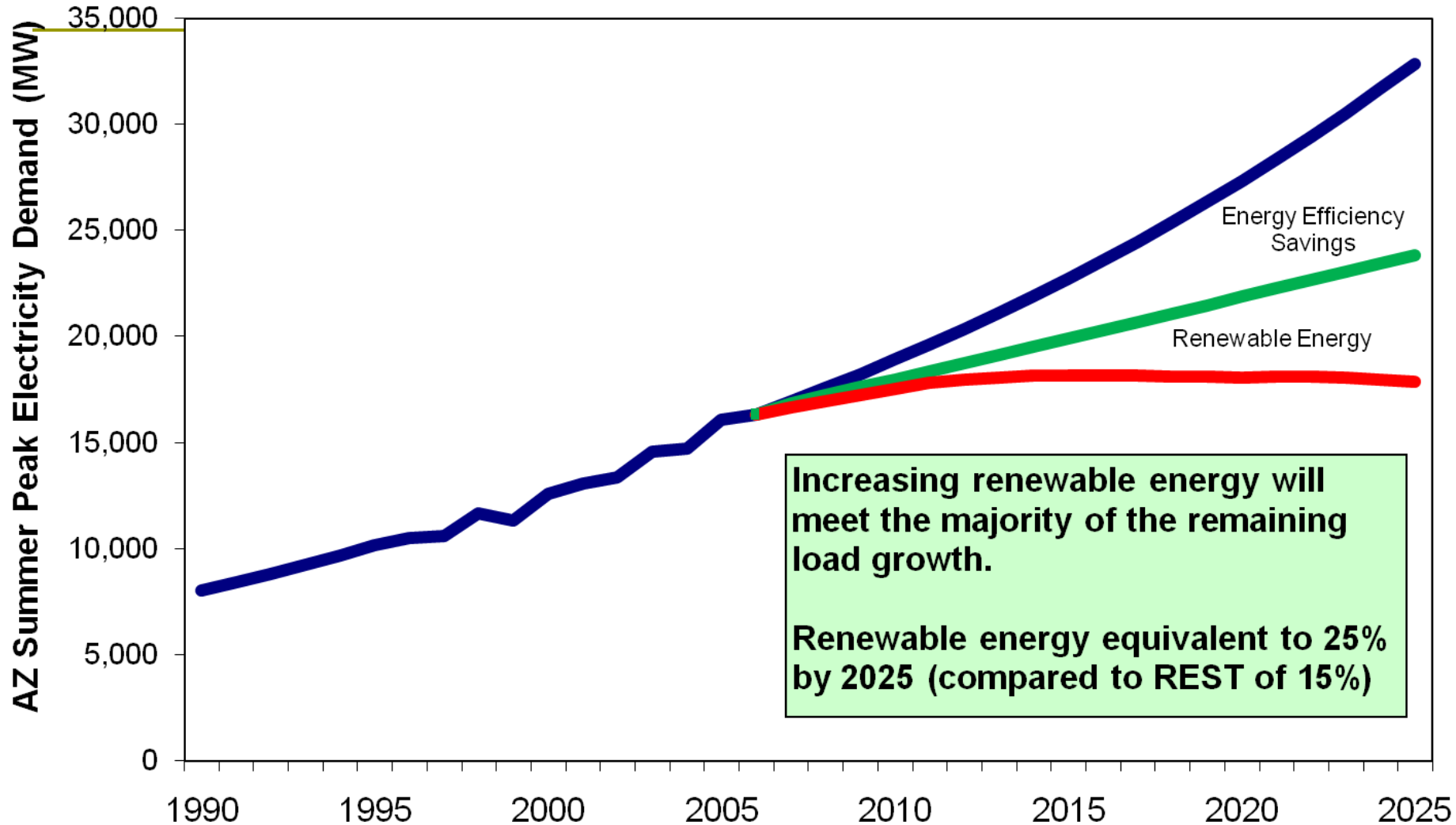
Arizona Facing High Growth in Peak Demand



Energy Efficiency Reduces Peak Growth and the Pressure on Infrastructure and Prices



Renewable Energy Provides the Majority of Future Generation Resources Needed

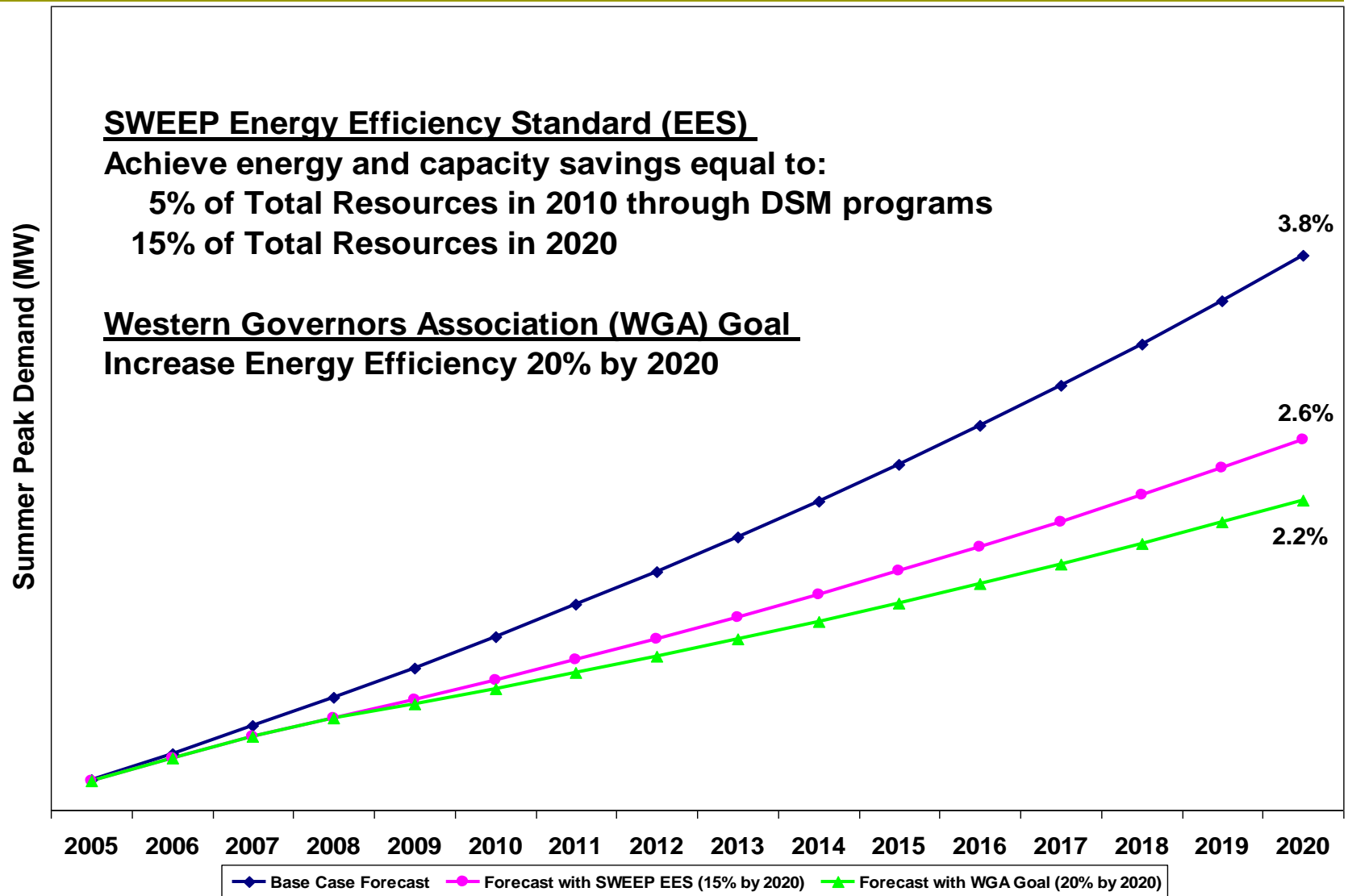


Choices at the Crossroads

- ❑ How will the energy needs be met?
- ❑ Which energy resources will be chosen?
- ❑ Who will pay the billions? How?
- ❑ How will Arizona choose to grow?

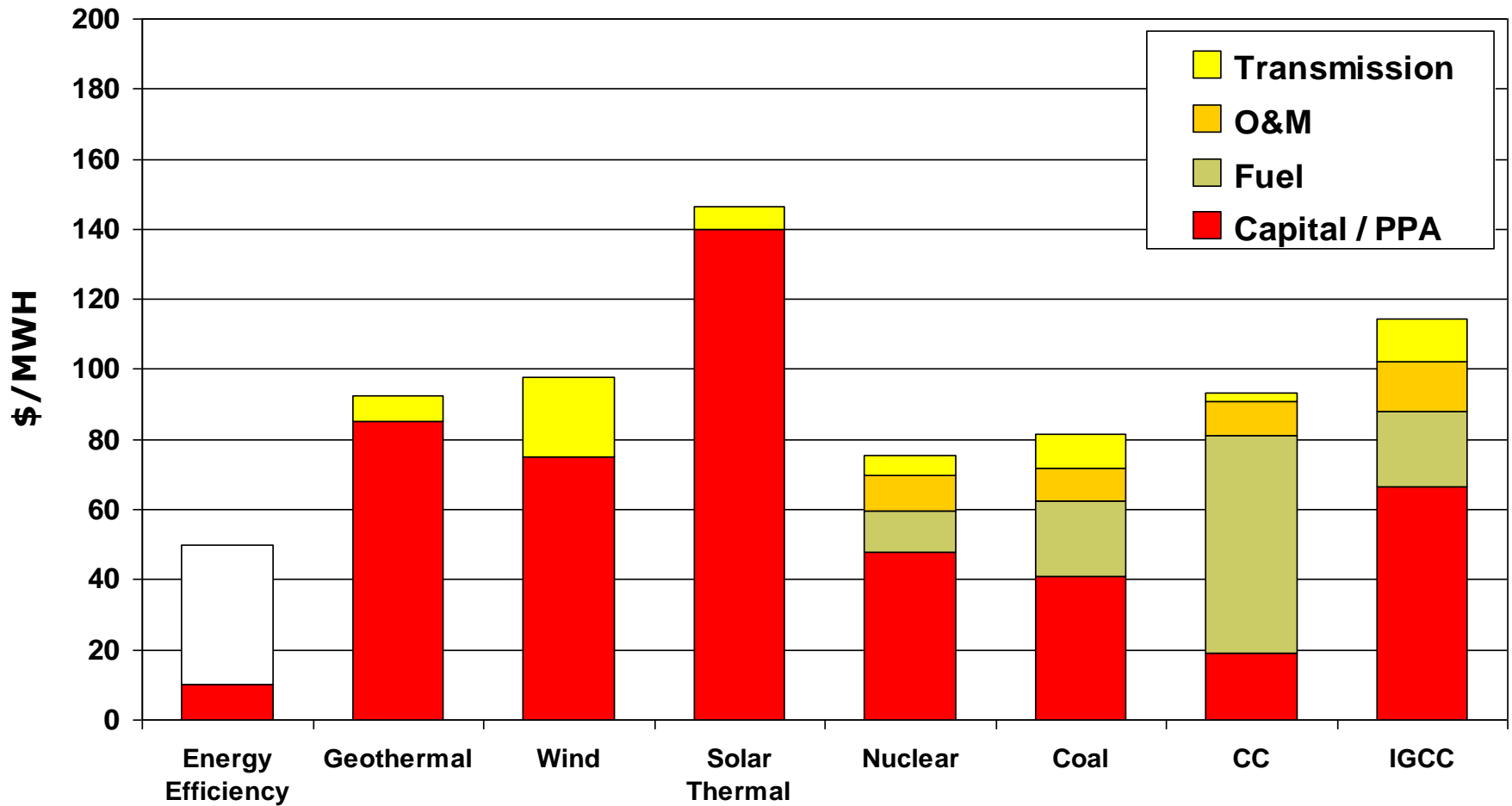
- ❑ *A combination of energy efficiency and renewable energy can meet the future energy needs of Arizona consumers and businesses, while providing significant benefits to utility customers, the energy system, the economy, and the environment.*

Energy Efficiency Reduces Energy Use and Peak Demand



Delivered Cost of New Resources

Lifetime Levelized w/ 2007 In Service Date



Summary of Resource Potential

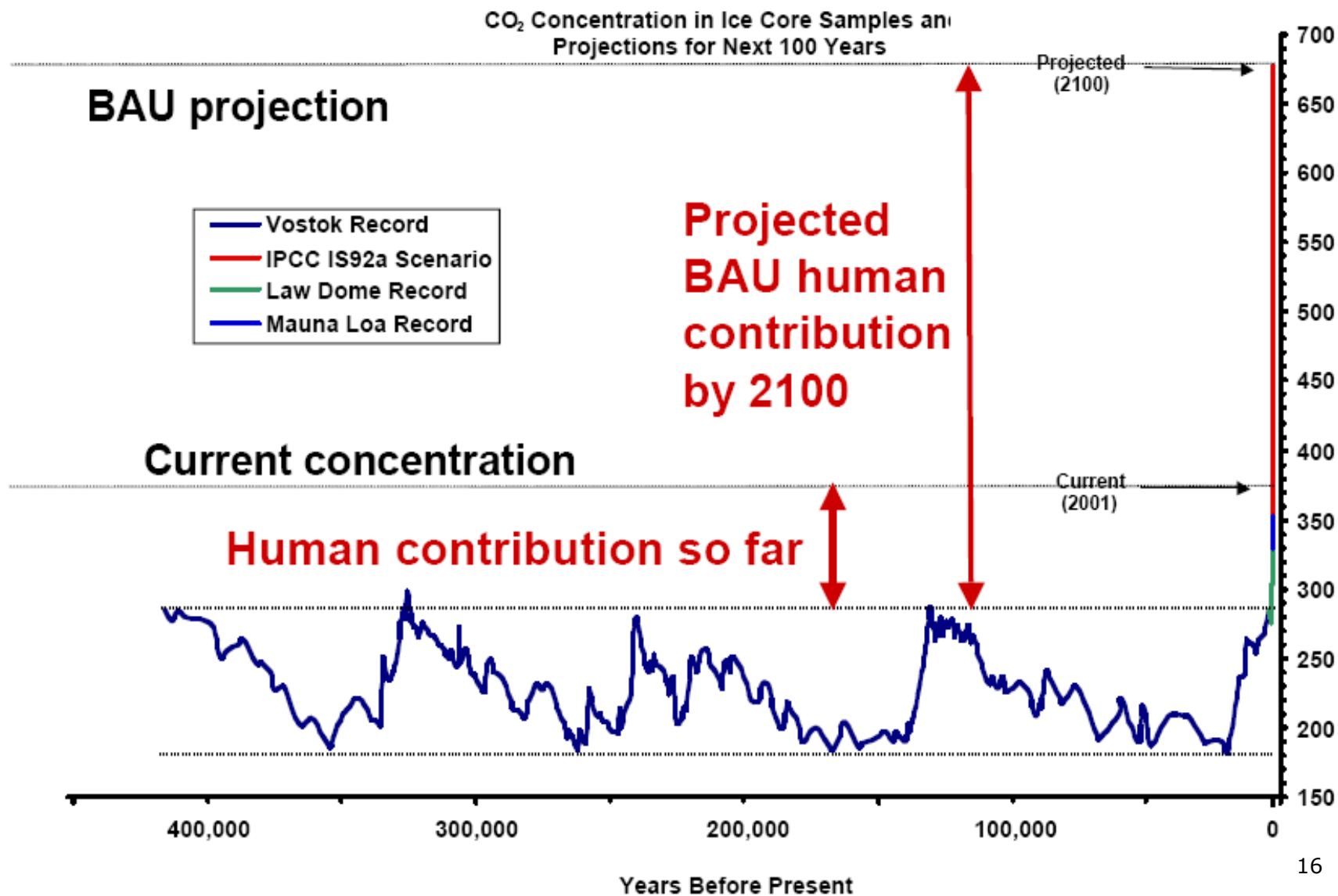
	High	Medium	Low	Comments
Energy Efficiency	√	√		Lowest cost resource, Dependent on customer acceptance and participation
Geothermal		√		Limited availability due to competition in S. Calif. Market, Dependent on PTC
Solar		√		Dependent on ITC
Natural Gas		√		Lowest capital cost, Some carbon risk, Fuel price risk
Wind – Exist Transm – New Transm		√	√	Limited availability Long line transm not cost effective
Nuclear		√		Lack of recent nuclear construction, Cost uncertainty
Pulverized Coal		?		Fuel price and abundance, Carbon risk
IGCC			√	High investment cost even w/o CCS

Energy Efficiency and Transmission Planning

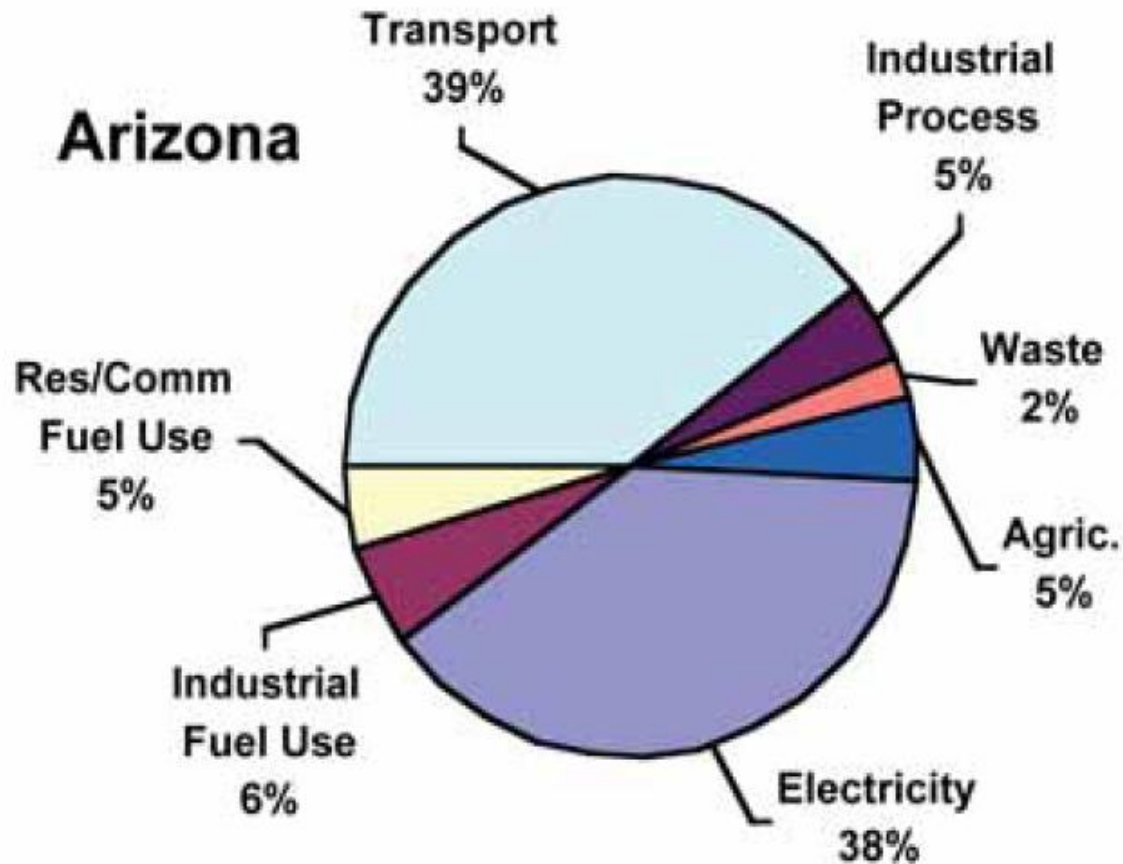
- ❑ Planning for a system growing at 1.0-2.0% annually is different than planning for a system growing at 2-3.5%
- ❑ EE programs and policies can be targeted to reduce peak demand (e.g., commercial lighting and HVAC)
- ❑ Energy efficiency and other DSM can be geographically targeted to load centers and substations
- ❑ EE can be ramped up relatively quickly



Historic and Projected GHG Trends, Dr. John Overpeck



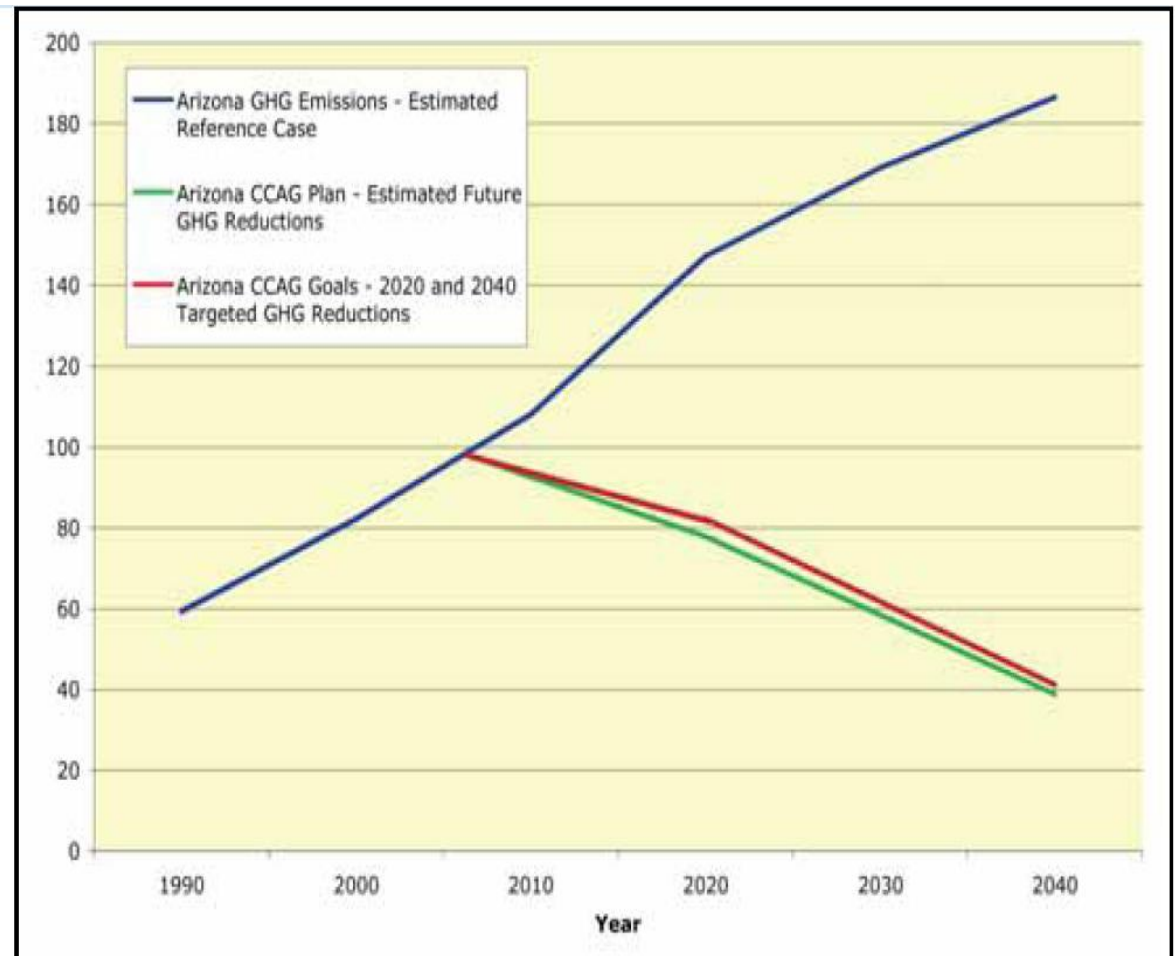
Arizona Greenhouse Gas (GHG) Emissions in 2000



Source: AZ CCAG Climate Change Action Plan, Final Report, August 2006

Arizona Set Greenhouse Gas Reduction Goals

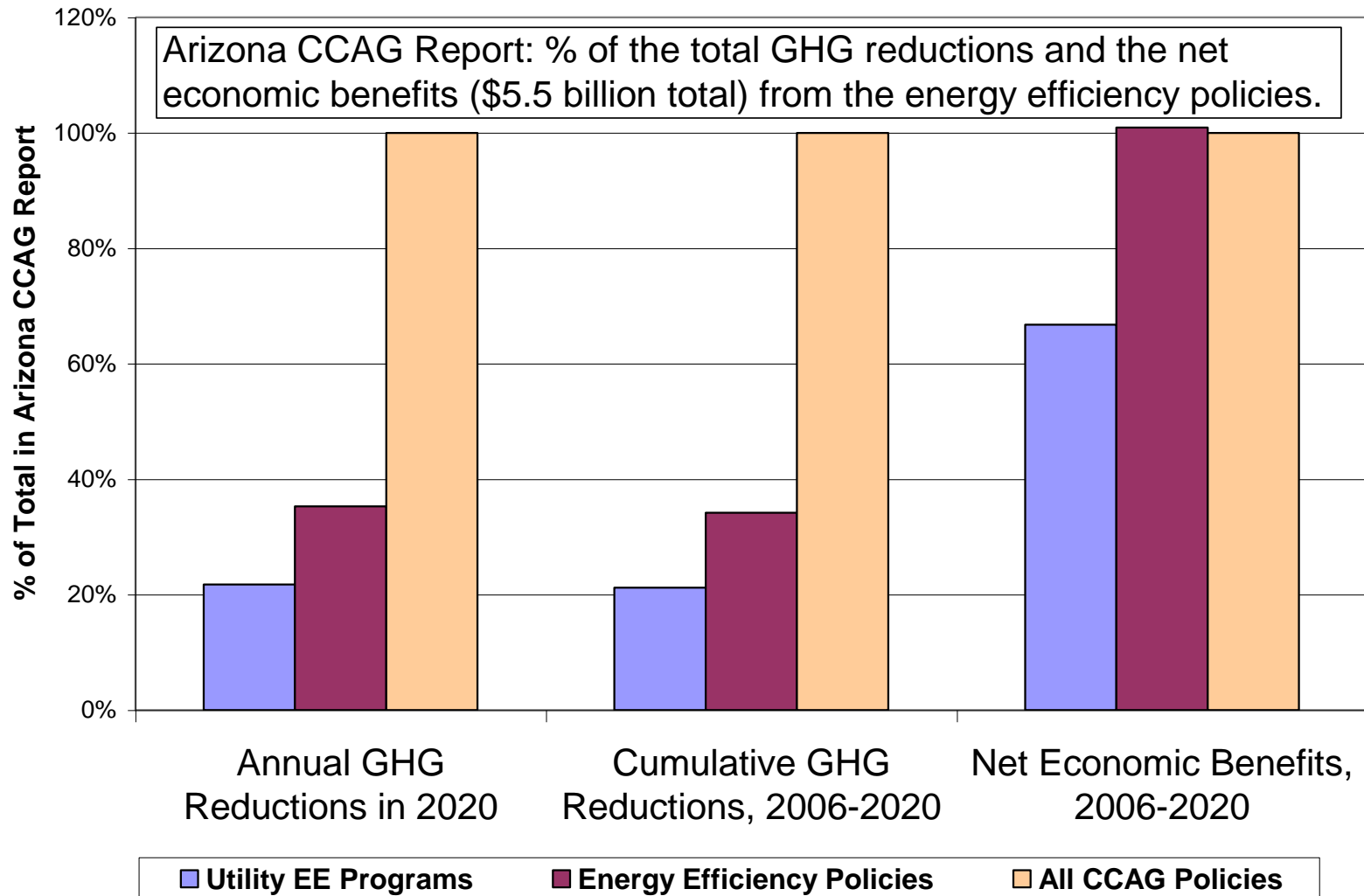
- Governor Napolitano set goal to reduce greenhouse gas emissions to year 2000 levels by 2020
- Governor also set goal to be 50% below year 2000 levels by 2040



Energy Efficiency and Climate Change

- Early, aggressive action is essential (waiting exacerbates the problem and costs)
- Must “bend the line down”
- EE reduces GHG emissions significantly
- EE provides net economic benefits (benefits exceed the costs)
- Maximize the early adoption of “no regrets” climate strategies such as EE
- Build *energy efficient* infrastructure - build it right the first time

Energy Efficiency Provides 1/3 of the GHG Reductions in the Report, and \$5.5 Billion in Net Economic Benefits



SWEEP Recommendations

- ❑ Design and implement cost-effective energy efficiency programs in the utility sector
- ❑ Adopt energy efficiency goals and funding mechanisms to support utility sector energy efficiency programs
- ❑ Upgrade building codes, support code implementation
- ❑ Adopt appliance/equipment standards
- ❑ Promote highly efficient new buildings (zero-net energy) and beyond-code building standards
- ❑ Adopt “best practices” in public sector energy management to lead by example
- ❑ Adopt utility rate, pricing, and market reforms
- ❑ Incorporate EE in air pollution control and climate strategies

Energy Efficiency Strategies & Policies

Common Types of Utility Energy Efficiency Program Strategies

- ❑ Financial incentives (rebates) for households that purchase efficient appliances, air conditioners, lighting products and controls, or shell measures
- ❑ More efficient and better operated residential and commercial air conditioning systems, with quality installation by trained contractors
- ❑ Grants for low-income home weatherization
- ❑ Direct installation of energy efficiency measures in homes and businesses
- ❑ Audits/assessments and financial incentives for businesses that upgrade energy efficiency
- ❑ On-the-bill customer repayment for energy efficiency measures
- ❑ Training, certification and outreach to builders, contractors, and energy service providers
- ❑ Training and technical assistance for commercial and industrial facility managers
- ❑ Design assistance and incentives for builders and developers that construct energy efficient new homes or commercial buildings
- ❑ Assistance and incentives for realtors and consumers to sell/purchase energy efficient homes

Other Energy Efficiency Policies

- ❑ Up-to-date building energy codes along with training of builders and contractors to support building codes and code enforcement
- ❑ State appliance efficiency standards and support of federal standards
- ❑ Income tax credits or sales tax exemptions for households or businesses that purchase highly efficient products
- ❑ Electricity pricing reform to provide greater incentive for conservation; e.g. through inverted block rates

Energy Efficiency Programs

- ❑ Residential new construction
- ❑ Retail products (lighting and appliances)
- ❑ Swimming pools and pumps/controls
- ❑ Residential existing homes, with HVAC and quality installation, home performance and “umbrella” residential existing homes
- ❑ Low income weatherization
- ❑ Commercial & industrial new construction
- ❑ C&I existing facilities retrofit (large/med.)
- ❑ Industrial programs
- ❑ Small business (direct marketing, direct install, contractor delivered program)
- ❑ Schools and government facilities

New Homes – Three Part Approach

- Push the envelope
 - “Zero net energy” homes, high performance homes (at least 30% more EE)
 - On-site renewables
- Mainstream/mass market
 - Energy Star/Power Wise homes (15% more EE)
- Bring up the bottom
 - Building energy codes and standards, with code support and training



Commercial New Construction

- ❑ Early alert and lead generation system – identify projects years in advance
- ❑ Design assistance and technical support during the design process
- ❑ Financial incentives to encourage design and installation of very efficient measures and to reduce first cost reengineering
- ❑ Leverage LEED and other systems
- ❑ Commissioning to ensure the building performs as designed



Business Case for Utility Support of Energy Efficiency

- Financial disincentive to utilities –EE results in lower revenues and less-than-full recovery of fixed costs between rate cases
- Solution: better align utility earnings with the public interest through:
 - Timely recovery of EE program costs
 - Performance-based incentive mechanisms
 - Decoupling of revenues from sales

Policy Forums in Arizona



- ❑ Arizona Corporation Commission (ACC) – utility regulators
- ❑ Salt River Project (SRP) - board/managers
- ❑ State legislature
- ❑ Governor's office and state administration

- ❑ Cities and counties
- ❑ Industry Alliances
- ❑ Congressional delegation
- ❑ Federal economic stimulus

Federal EE Actions and Opportunities, Current Bills

- EE as part of the Economic Stimulus
 - EE provides more jobs per million \$ invested
 - EE programs are “shovel ready” and can be ramped up quickly
 - Funding to expand and supplement programs, not supplant them; coordination with state, municipalities and local governments
- Energy Efficiency Resource Standard (EERS) – 10% or 15% by 2020
- Energy Bill (policies and funding)
- Climate Change Bill (effective in 2012?)

SWEEP:

Dedicated to More Efficient Energy Use in the Southwest

Resources available online at:

www.swenergy.org

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