



Synapse
Energy Economics, Inc.

Energy Future A Green Energy Alternative for Michigan

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- Consultants on energy and environmental issues.
- 19 professional staff with over 200 combined years of experience on resource planning issues.
- Clients have included
 - US EPA, US DOE, US DOJ.
 - Regulatory Commissions in 11 states
 - Consumer Advocates and AGs in 20 states, including North Carolina
 - Large and small cities and towns
 - National Association of Regulatory Commissioners
 - Non-governmental clients including local and national environmental and consumer organizations

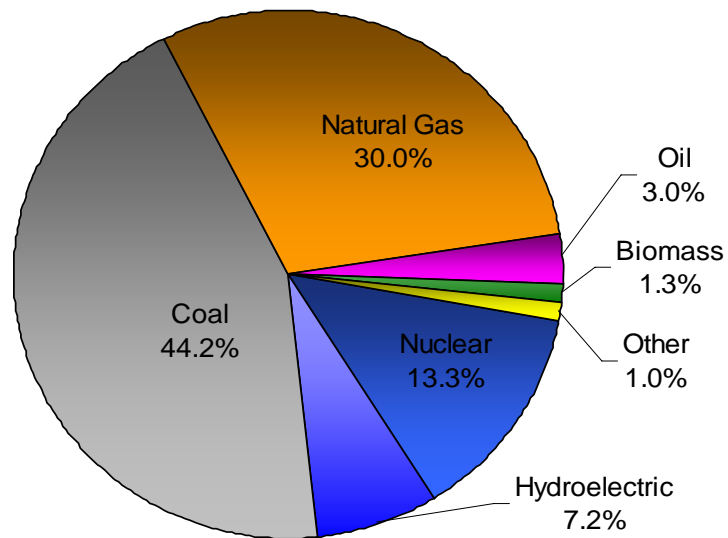
1. Review 21st Century Electric Energy Plan released by Michigan PSC in 2007.
2. Review Balanced Energy Initiative filed by Consumers Energy in 2008
3. Examine the need for and alternatives to individual coal power plant projects proposed for state of Michigan
4. Investigate potential for a green energy future for the state.

- 21st Century Electric Energy Plan – good first step but
 - Overestimated load growth and, consequently, need for new baseload plants
 - Underestimated coal plant construction costs
 - Did not adequately account for the costs of inevitable greenhouse gas emission regulations.
- Michigan's most-attractive energy choice by any measure is energy efficiency -- can be quickly implemented, save energy, make businesses more productive, lower energy bills, create jobs, avoid pollution, and keep money in Michigan.

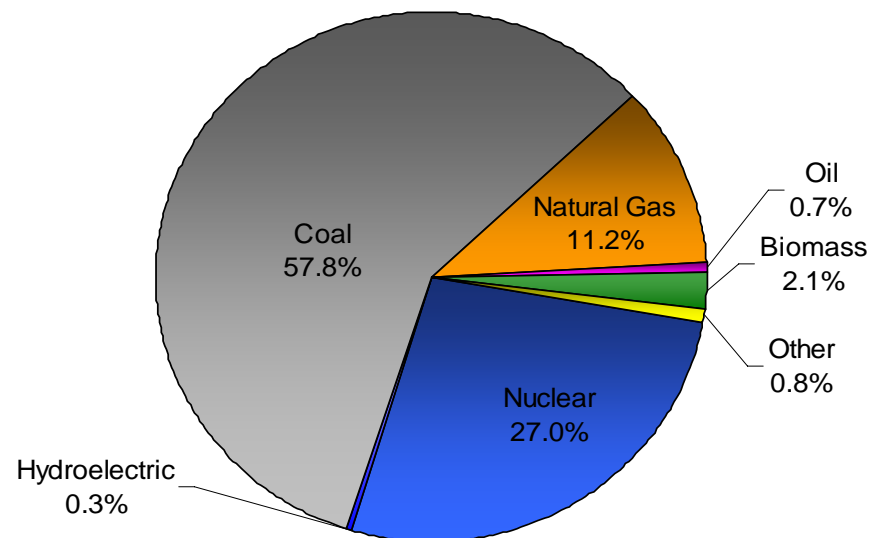
- A portfolio of 21st Century choices involving energy efficiency, demand response, renewable resources, and combined heat and power is less expensive, cleaner, faster, more economically robust, and creates more jobs in Michigan than a 20th Century plan based on new large fossil-fired power plants.
 - Would create jobs in the manufacture and/or installation of wind turbines and solar cells, and implementation of efficiency improvements to homes, businesses and other buildings;
 - Would retain energy dollars in-state that would otherwise be exported out-of-state
 - Would lead to lower future energy costs, thereby promoting the economic health of Michigan businesses and citizens.

Michigan's Historic Energy Mix - 2005

Capacity (MW)



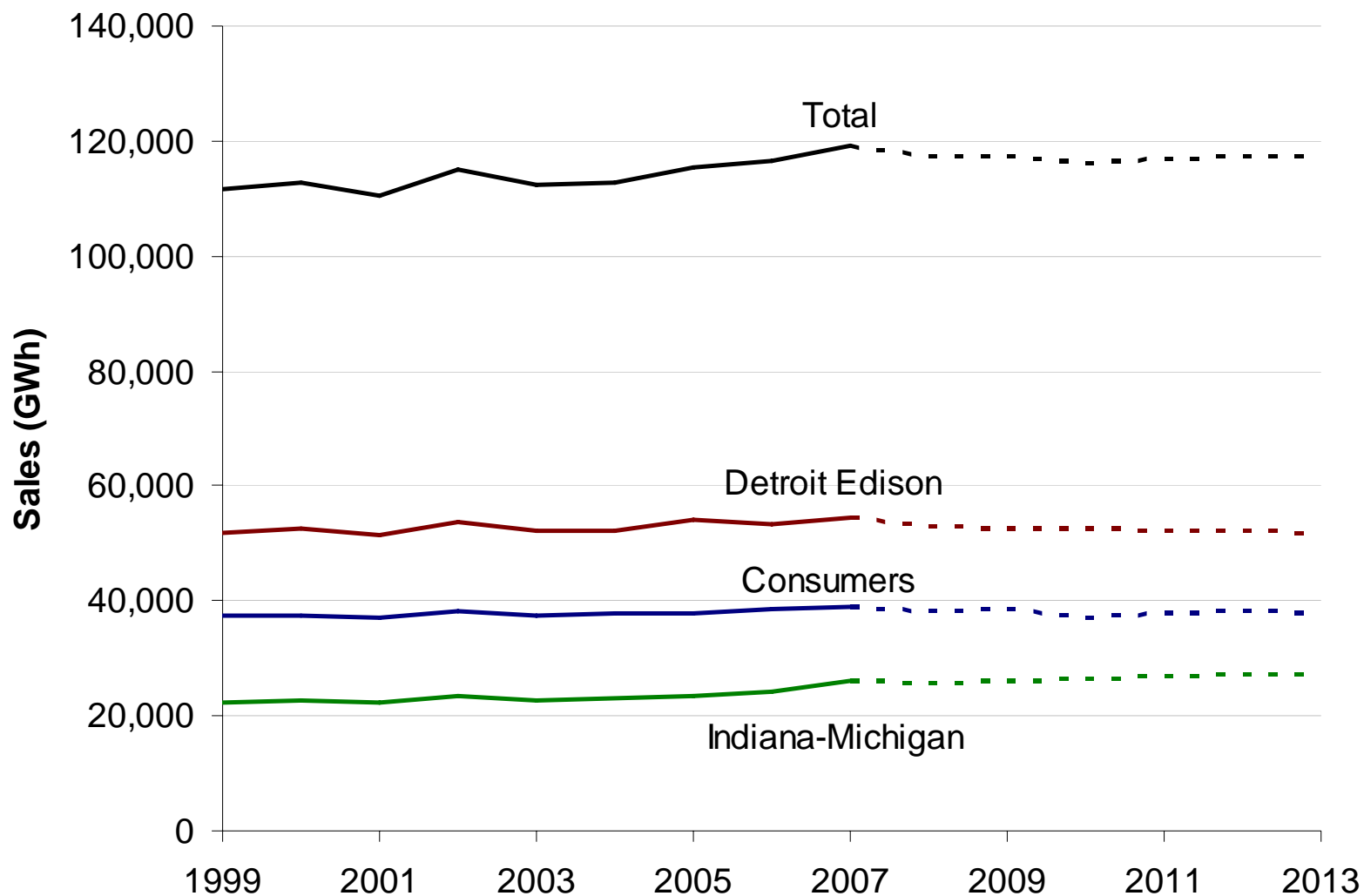
Generation (GWh)



21st Century Electric Energy Plan

- In 2007, the Plan projected that by 2020 the state would need 10-17% more electricity than in 2008.
- BUT electricity sales actually decreased by 3.4% in 2008 and are expected to decline by 6.7% in 2009.
- Two largest electric utilities in state, Consumers Energy and Detroit Edison, now forecast that electric consumption will be flat through 2016 and that customer loads actually will decline slightly from 2007 to 2013.
- For example, Detroit Edison is forecasting a summer 2013 peak load of 11,529 MW compared to its 2007 peak load of 12,229 MW.

Forecast Electric Consumption 2008 to 2013



21st Century Electric Energy Plan Forecast a Need for a Mix of New Resources

- 21st Century Plan forecasted a need for new supply resources to meet expected growth in demand.
 - Said that without any energy efficiency, Michigan would need no fewer than four new 500 MW baseload units by 2015.
 - With energy efficiency, only two new baseload units would be needed.
 - With energy efficiency and a renewable portfolio standard, only a single new 500 MW unit would be needed.
- Plan's conclusion on energy efficiency -- "By displacing traditional fossil fuel energy, the energy efficiency program alone could save Michigan \$3 billion in electricity costs over the next 20 years."

Utility and Merchant Response to 21st Century Electric Energy Plan

- However, eight new coal plants were proposed
- Two have been cancelled
- Remaining six coal plant proposals are:

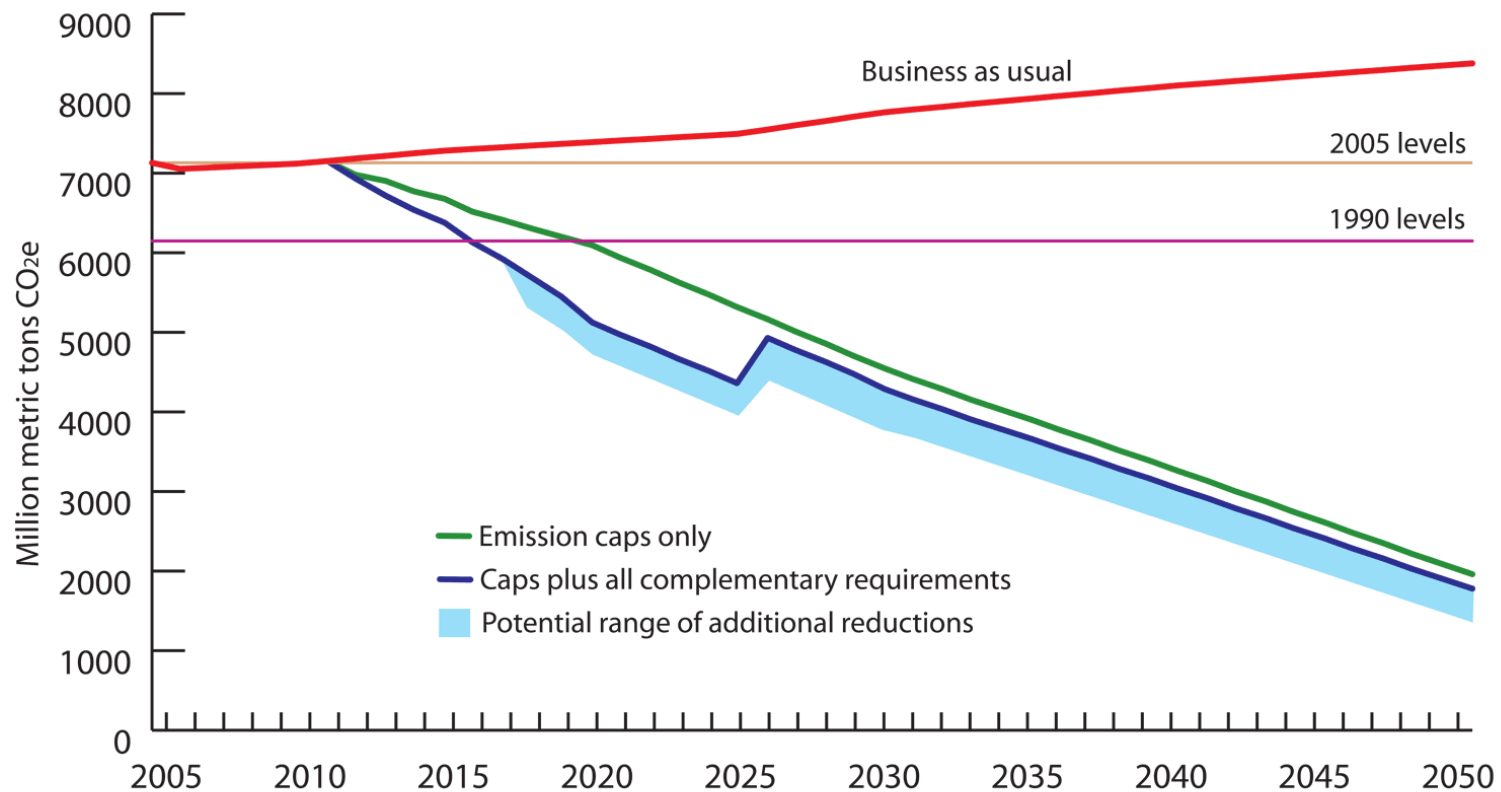
Plant Description	Proposed Capacity	Plant Status (as of July 2009)
Wolverine/ Wolverine Power Co-operative	600 MW circulating fluidized bed	Draft air permit and MACT determination issued by MDEQ.
Lansing/ Lansing Board of Water and Light	250 MW (70% coal, 30% biomass)	Proposed for operation by 2018.
Board of Holland Public Works	78 MW	Draft air permit and MACT determination issued by MDEQ
Bay City/Consumers Energy	830 MW supercritical	Draft air permit and MACT determination issued by MDEQ. Proposed to be operational by 2017.
Alma/ M&M Energy	750 MW IGCC	M&M announcement. Tax credit applications filed with town and state. No permit application filed.
Filer Township / Tondu	Expansion of existing 75 MW to 250 MW IGCC	Local announcement
Total	2683 MW	

Proposed Coal Plants Would Create Significant Risks for the Michigan Economy and Ratepayers

- Would lock Michigan ratepayers into expensive coal plant construction costs -- 6 new coal plants would cost state ratepayers in excess of \$12 to \$14 billion.
- Each new plant would export tens to hundreds of millions of dollars each year to buy coal mined in other states.
- The 6 proposed new coal plants would emit an estimated 19 million tons of CO₂ each year for estimated 60 year operating lives – a total of 1.2 billion tons of CO₂.
- Purchasing CO₂ emissions allowances would be expensive - could cost ratepayers between \$260 and \$800 million annually in early years of operations and \$760 million to \$2.3 billion annually in later years.

Federal Regulation of CO₂ Emissions is a Matter of When, Not If

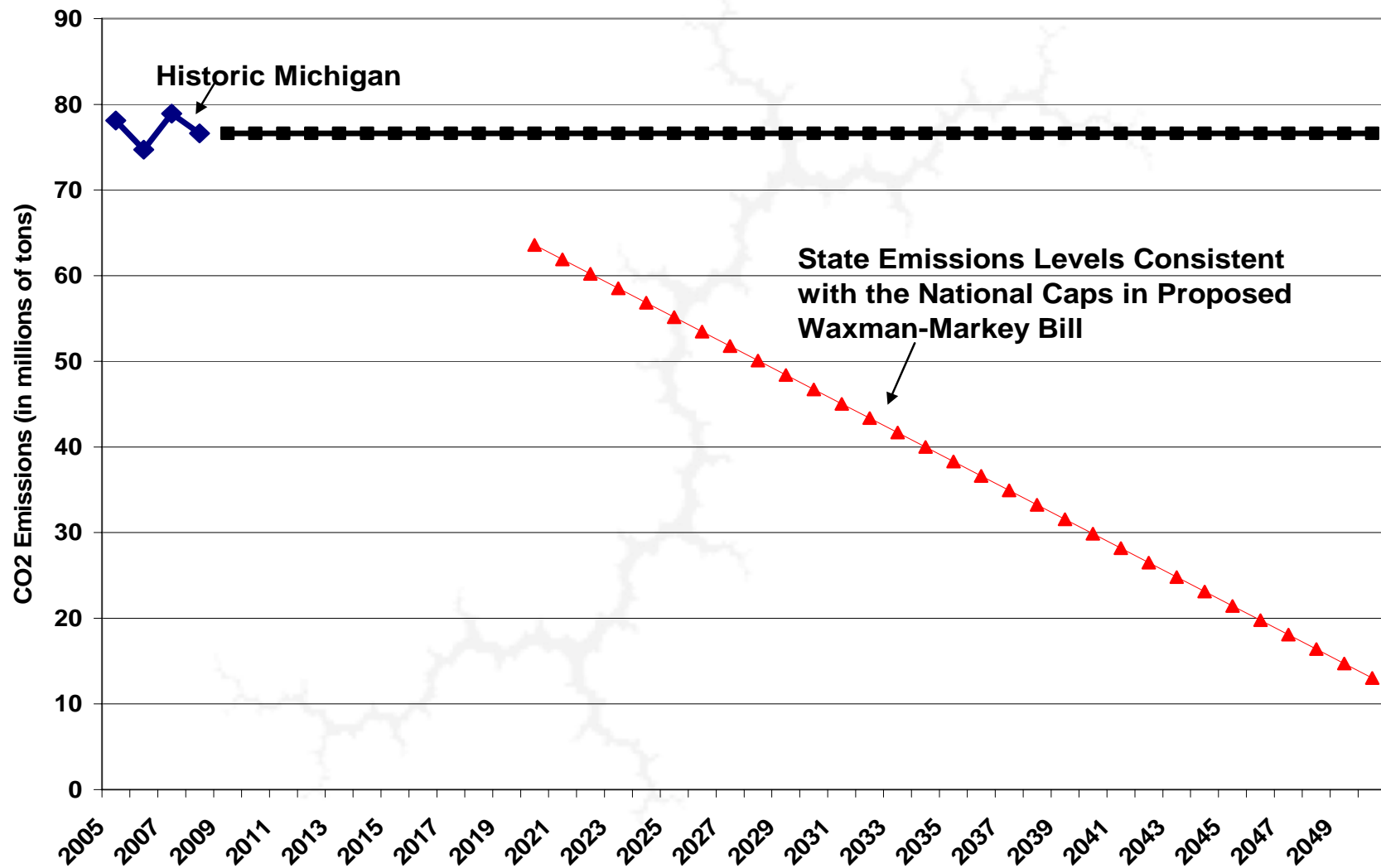
Emission Reductions Under H.R. 2454,
the American Clean Energy and Security Act, 2005-2050
May 19, 2009



 WORLD RESOURCES INSTITUTE

This analysis reflects the amendment in the nature of a substitute to H.R. 2454 released on May 18, 2009. For a full discussion of underlying methodology, assumptions and references, please see <http://www.wri.org/usclimatetargets>. WRI does not endorse this proposal.

State of Michigan Will Have to Act to Reduce CO₂ Emissions



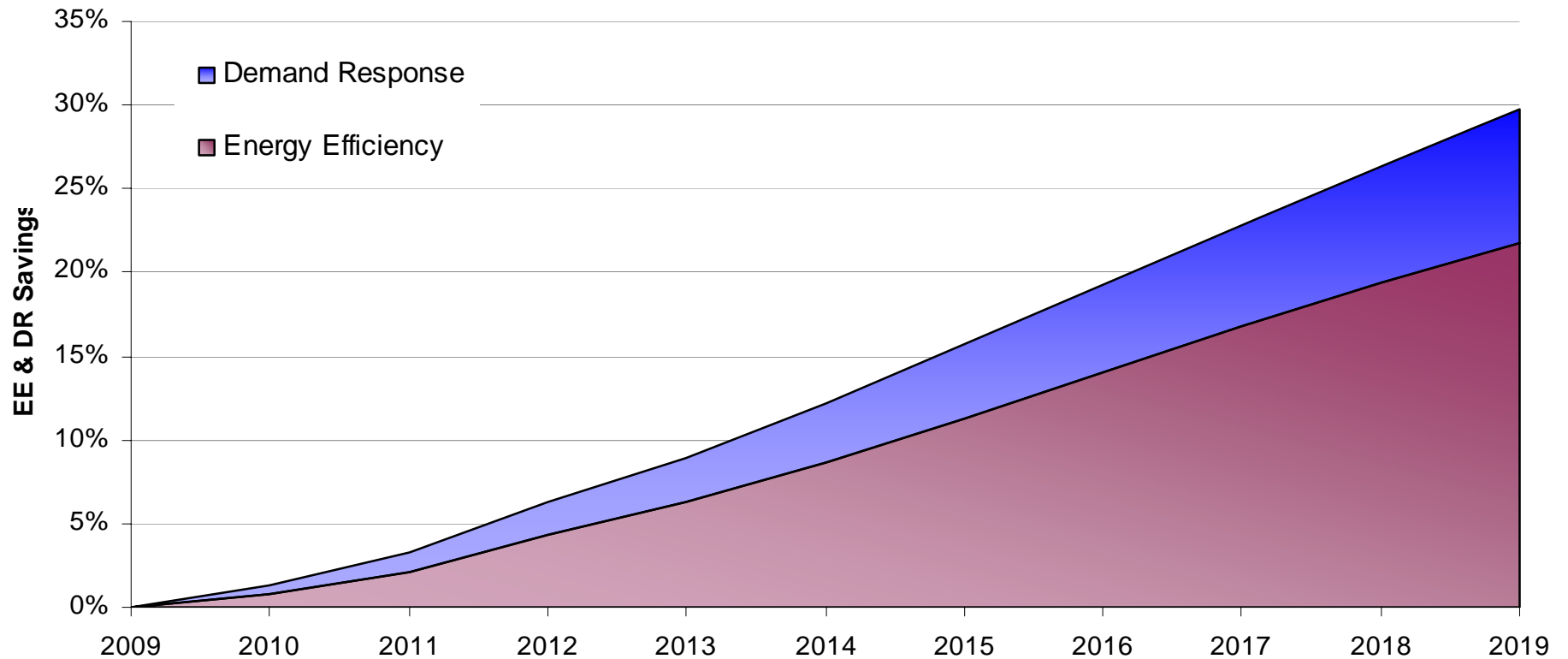
An Alternative Green Future for Michigan

- Instead of adding new fossil-fired plants, there is a substantial in-state potential for cost-effective:
 - Energy efficiency and demand response
 - Combined heat and power (CHP)
 - Renewable Resources
- State could become a net exporter of renewable resources to other states in the Midwest.

Potential for Energy-Efficiency and Demand Response (1)

- Michigan has the potential for a 7,000 MW reduction in loads during peak demand periods through energy efficiency and demand response technologies.
- This nearly 30% reduction would save nearly 19,000 GWh of energy annually—approximately 17% of the state's total energy consumption in 2008.
- The levelized cost of these savings would be only 2.9 cents per kilowatt-hour, far lower than the cost of generating power at any of the proposed coal-fired power plants.

Potential for Energy Efficiency and Demand Response (2)



As percentage of 2008 demand forecast (in MW)

Potential for Energy Efficiency and Demand Response (3)

	MWh Savings in 10 Years		MW Savings in 10 Years	
	2002 Study	2008 Results	2002 Study	2008 Results
<i>Residential</i>				
New Construction	411,444	136,595	145	49
Replacement	2,265,303	2,334,497	801	1,259
Retrofit	1,301,756	3,964,595	414	997
Subtotal	3,978,503	6,435,687	1,215	2,256
<i>Commercial</i>				
New Construction	1,124,255	1,342,854	587	690
Retrofit	7,427,386	8,871,559	1,574	1,849
Subtotal	8,551,641	10,214,413	2,161	2,539
<i>Industrial</i>	2,885,231	2,217,557	729	560
Total	15,415,375	18,867,657	4,105	5,355

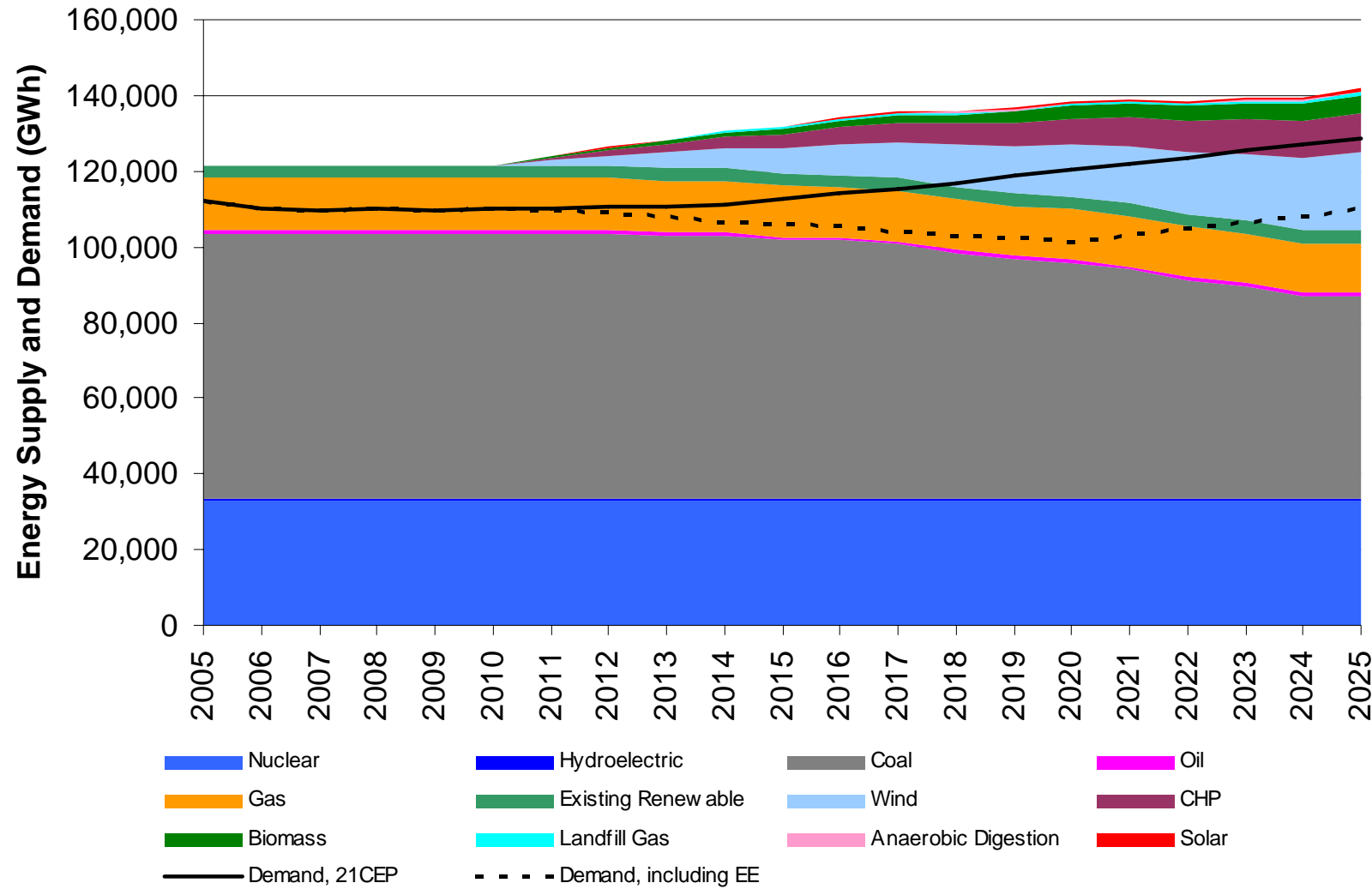
Potential for CHP and Renewable Resources (1)

- Michigan has the potential for 6,500 MW of combined heat and power facilities beyond the MPSC's estimate of 4,580 MW already online in the state
- Approximately 1,950 MW, or 30% of that potential, could be built over the next decade.
- Michigan also has the potential for more than 76,000 MW of potential renewable resources such as wind, biomass and solar, of which approximately 9,000 MW can be economically developed by 2025.
- These resources would generate over 27,000 GWh energy annually, or more than one third of today's demand.

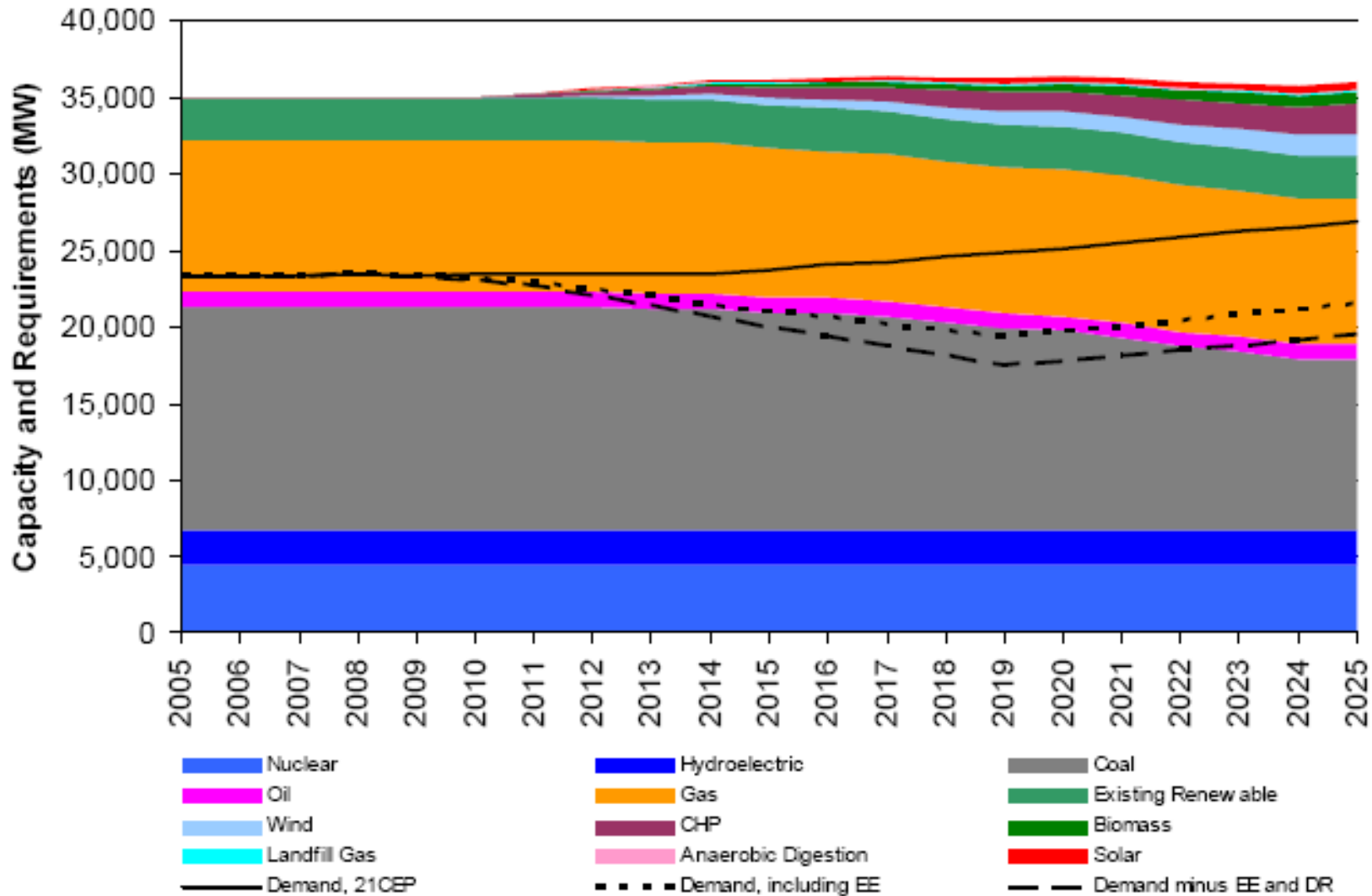
Potential for CHP and Renewable Resources(2)

Technology	Technical Potential ⁵² (MW)	Achievable Potential		
		Nameplate Capacity (MW)	Peak Capacity (MW)	Annual Energy (GWh)
Biomass, Forestry	248	174	174	1,067
Biomass, Urban Waste	204	143	143	874
Biomass, Agricultural	667	466	466	2,861
Landfill Gas	148	103	130	728
Anaerobic Digestion	51	36	36	283
Solar, Photovoltaic—Residential	18,121	326	183	428
Solar, Photovoltaic—Commercial	14,232	626	351	823
Wind, Onshore	16,565	1,988	398	4,717
Wind, Offshore	25,837	5,167	1,033	15,842
Total	76,073	9,029	2,914	27,623

An Alternative Green Energy Future for Michigan (GWh)



An Alternative Green Energy Future for Michigan (MW)



Jobs from the Green Alternative (1)

- Studies have found that investments in renewables and efficiency provide a net employment benefit relative to energy supply from traditional fossil resources.
 - Energy efficiency programs rely on large numbers of installers, contractors and laborers, work that cannot be outsourced, that confers local economic benefits and creates local jobs.
- NextEnergy Center 2007 study for Michigan DEQ found that combining an EE program with an RPS would cause the biggest improvement in Michigan's economy and would significantly reduce the state's CO₂ emissions.

Jobs from the Green Alternative (2)

- NextEnergy study concluded that a moderate EE program + a moderate RPS would create approximately 19,000 more jobs than a base case that added new coal-fired power plants.
- We agree but find that the NextEnergy Center understates the numbers of new jobs that could be created by aggressive EE program and RPS.
- For example
 - we found the potential for 5,355 MW of peak demand reduction from an aggressive EE program vs. 1,853 MW potential found by NextEnergy.
 - we also found potential for 27,000 GWh from renewable resources by 2025 vs. 21,631 GWh found by NextEnergy.