

Concrete Steps Toward A Green Energy Future for Michigan



NRDC

NATURAL RESOURCES DEFENSE COUNCIL

THE EARTH'S BEST DEFENSE

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Introduction

- NRDC – a national, non-profit environmental advocacy organization, with 1.2 million members nationwide, including 12,000 in Michigan.
- Michigan study commissioned by NRDC, conducted by Synapse Energy Economics, David Schlissel and his team of experts, released in August.

The challenge:

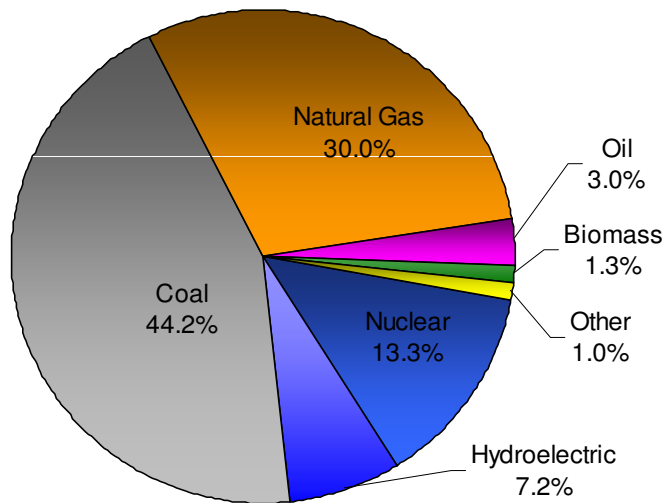
- Rebuild Michigan's economy on a foundation that positions the state to thrive economically in the 21st Century.
 - Lower energy costs by eliminating inefficiency;
 - Keep more energy dollars in the state by increasing reliance on home-grown efficiency and renewables;
 - Reduce carbon emissions to avoid costs of carbon allowances;
 - Become an exporter of carbon-free renewable electricity;
 - Turn existing manufacturing facilities into producers of clean energy components.

The problem with building new coal facilities now --

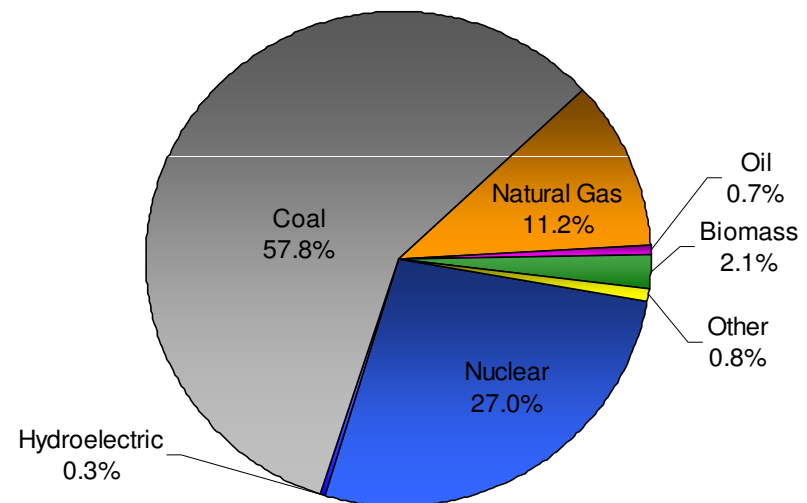
- Enormously costly to build – Consumers' projected costs for its proposed plant has already increased by 32% since 2007, but in Ohio and and North Carolina we're seeing costs more than double;
- Flat or possibility declining demand;
- Emit millions of tons of carbon, sulfur and nitrogen oxide pollution annually, with enormous uncertainty regarding cost of emissions;
- Putting a lot of energy investment eggs in one very risky basket;
- Not clean, not cheap, not nimble, not diversified, not a good investment choice.

2005 Electricity Generation and Capacity Mix

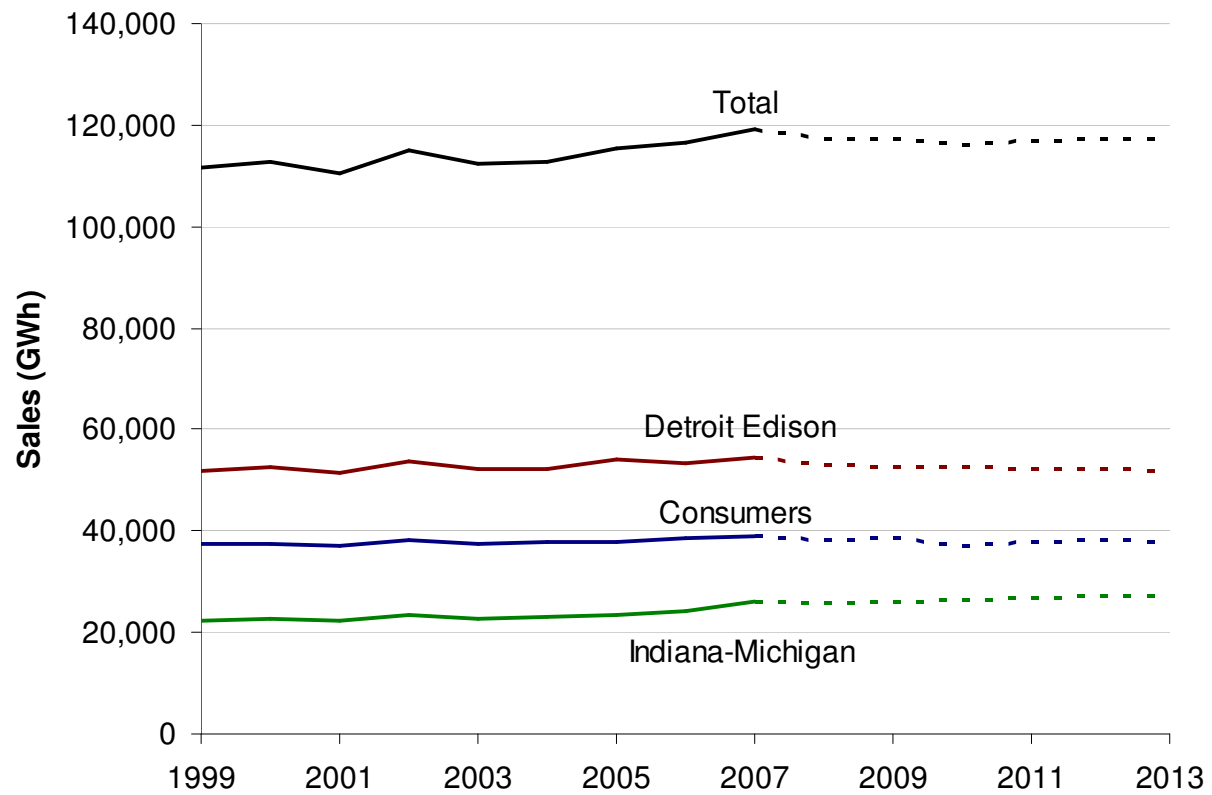
Capacity (MW)



Generation (GWh)



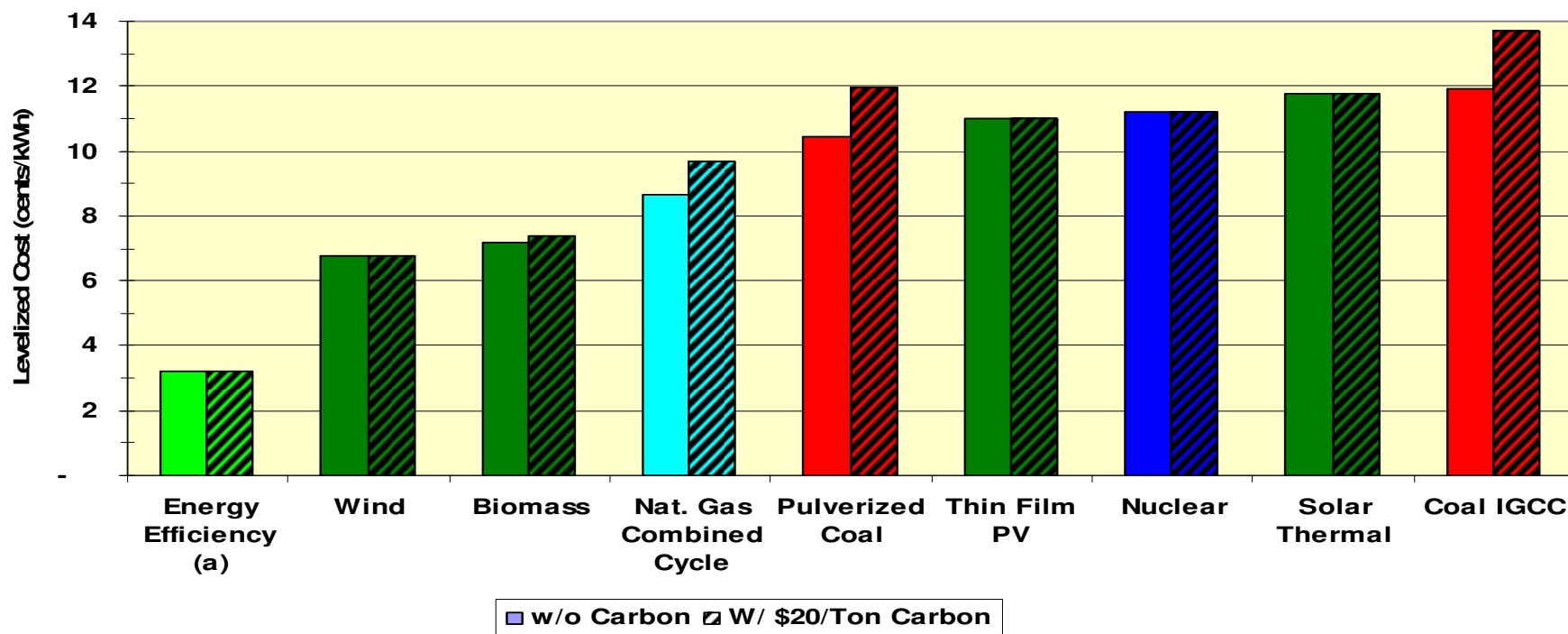
Current energy demand -



Forecast for Energy Demand in Michigan

- Historically, it was common to project 2% per year increases in electricity demand;
- Today, nationally, EIA projecting about 1% per year;
- In Michigan, total sales down 3.7% in 2008, and projected to be down another 6.7% in 2009.
- Reflects both the current economic downturn and longer term trend. Flat demand since 2002.

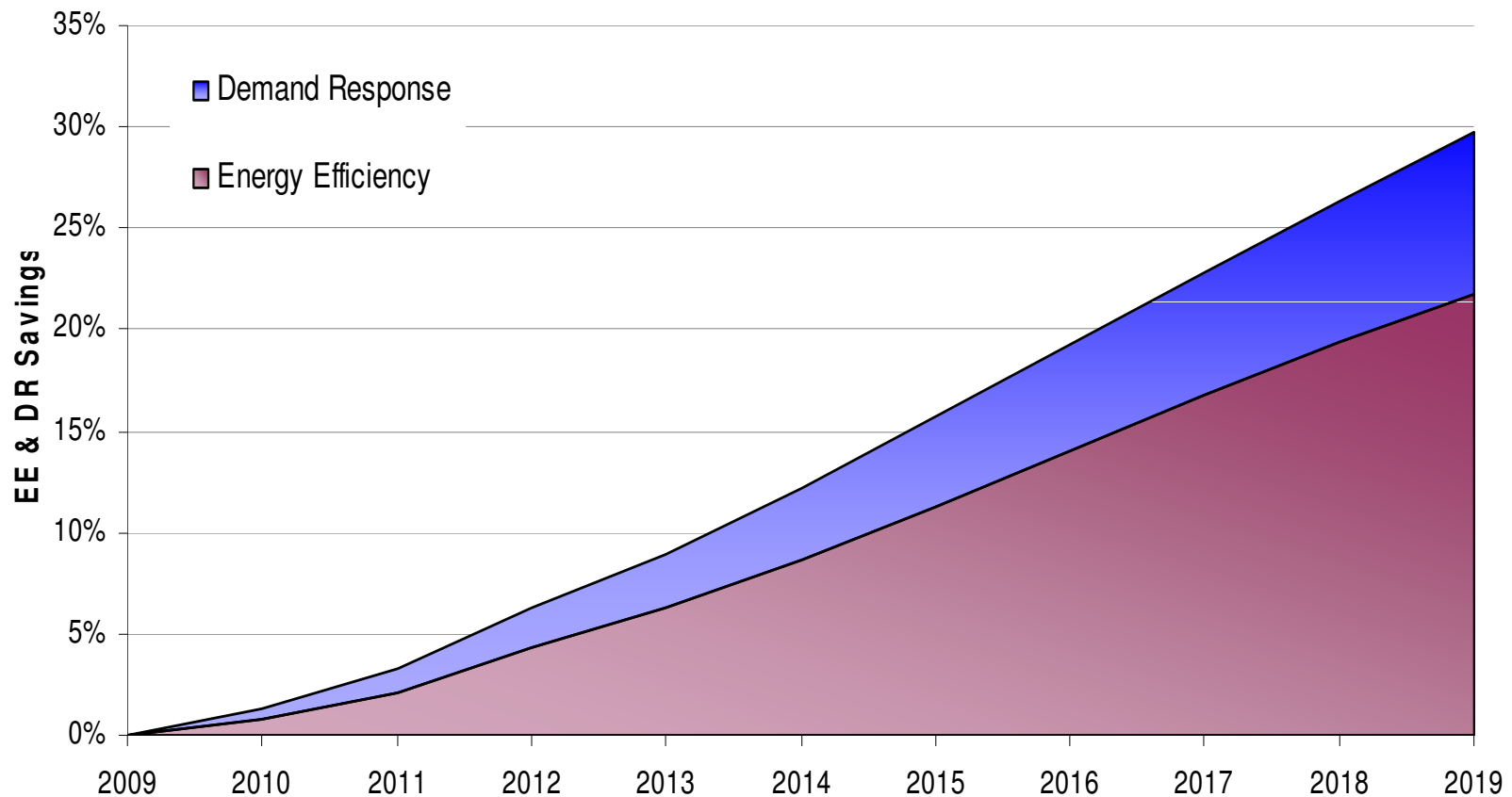
Costs of new generation sources



Potential for Demand Reduction with energy efficiency and load management

- The state 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.

Energy efficiency and demand response potential



	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

Benefits of EE

- Lowers bills – capture ee for 2.5- 3.0 cents per kwh; compared to 9-12 cents for generating, transmitting and distributing a kwh of power;
- Creates Jobs 3 ways –
 - Direct – conducting audits, installing measures.
 - Indirect – manufacturing windows, insulation, etc.
 - Savings stays in the local economy.

Potential for CHP

- The state 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.

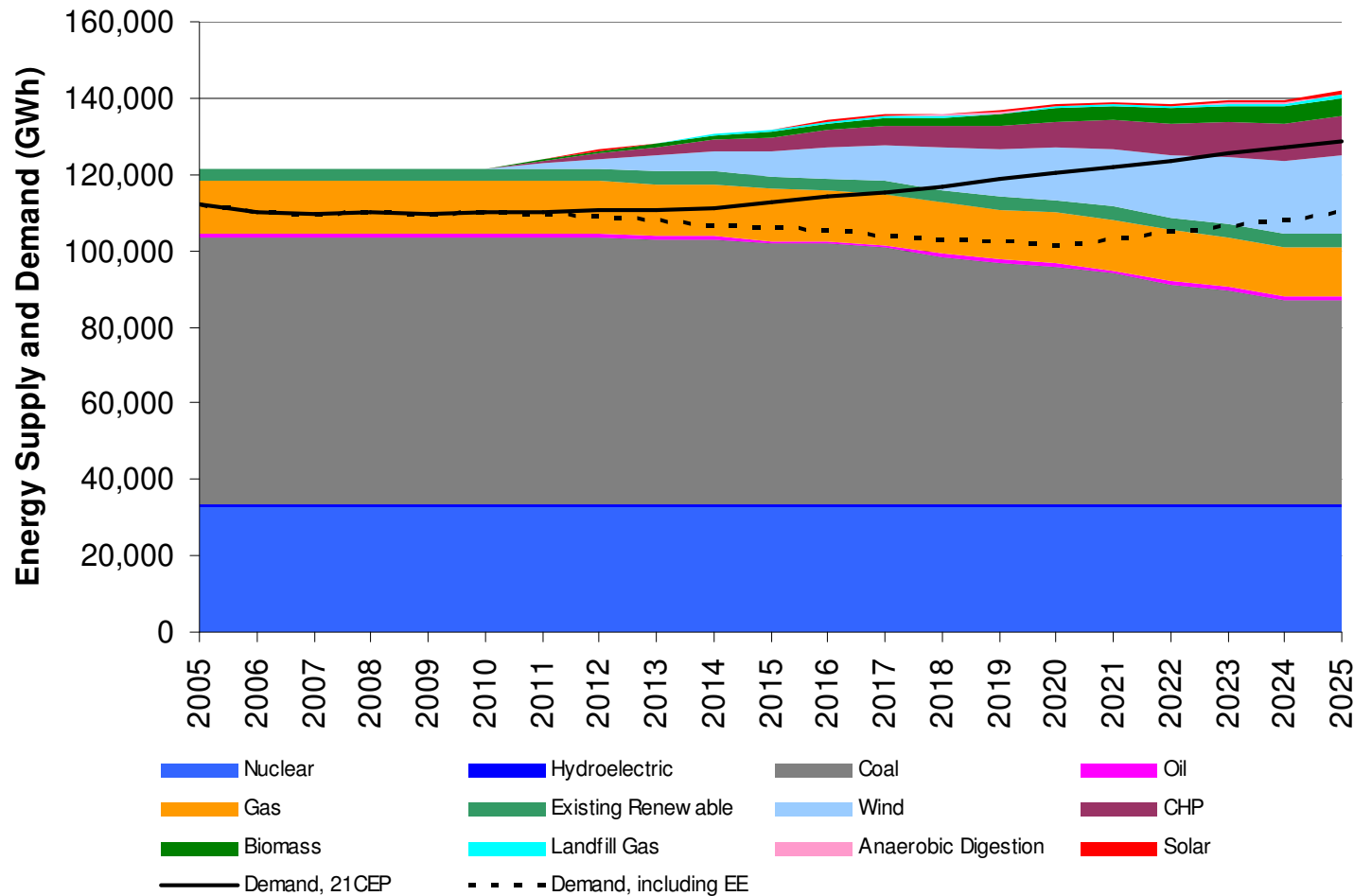
Potential for Renewable Energy

- The state 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.

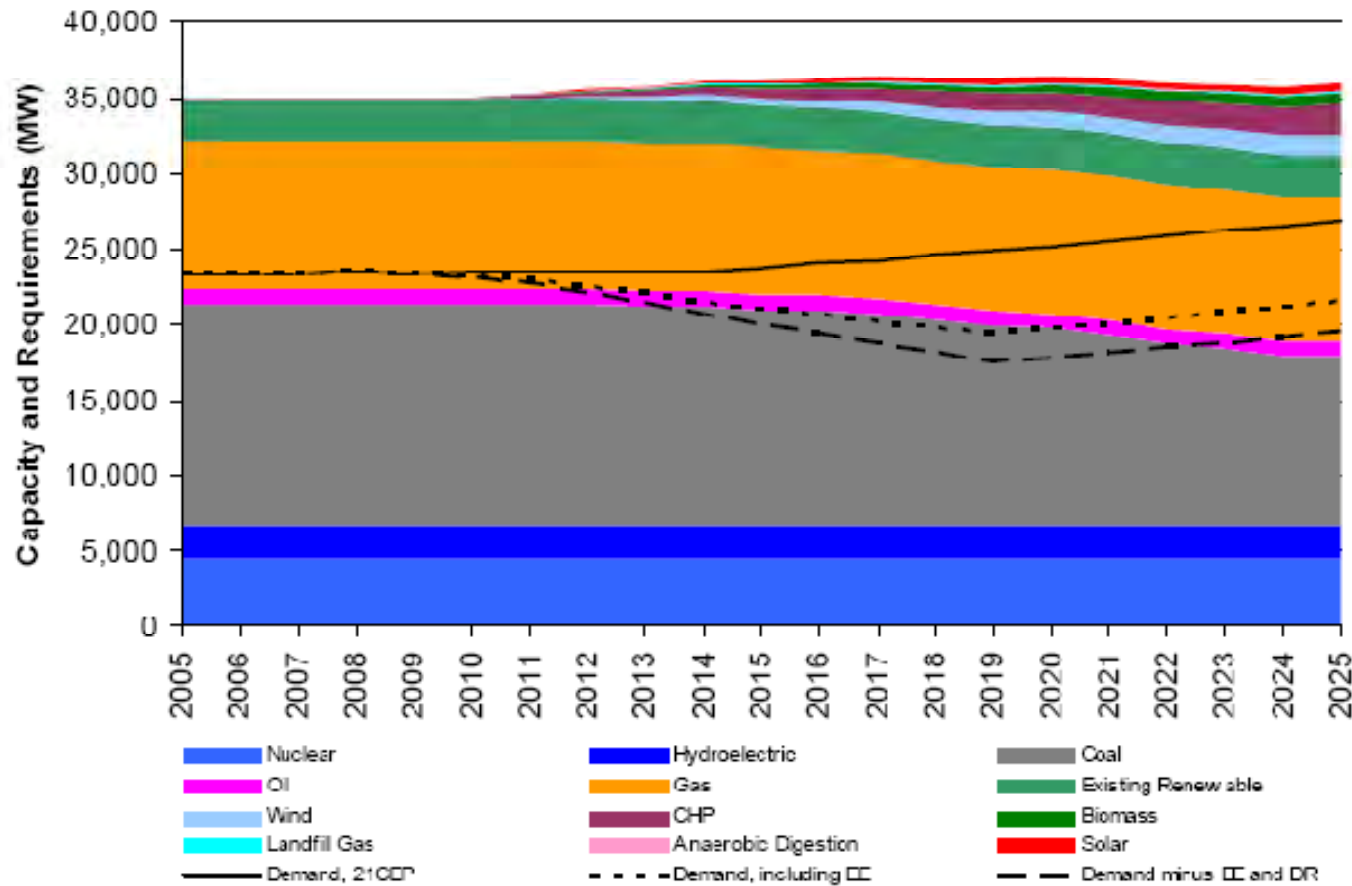
Renewable energy potential -

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

Putting it All Together - part 1



Putting it all together – Part 2



Better, More Jobs Under the Clean Energy Scenario

- Job creation for \$1 million investment in:
 - Oil and coal: 4-5
 - Renewables: 9-12
 - Building retrofits: 12
 - Transit: 16
 - Smartgrid: 9