

Michigan's Energy Future



Union of Concerned Scientists

Citizens and Scientists for Environmental Solutions

Michigan Energy Public Forum

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Steve Frenkel

Midwest Office Director

stevefrenkel@ucsusa.org

Combining independent scientific research and citizen action to secure responsible government policy, corporate practices, and consumer choices.

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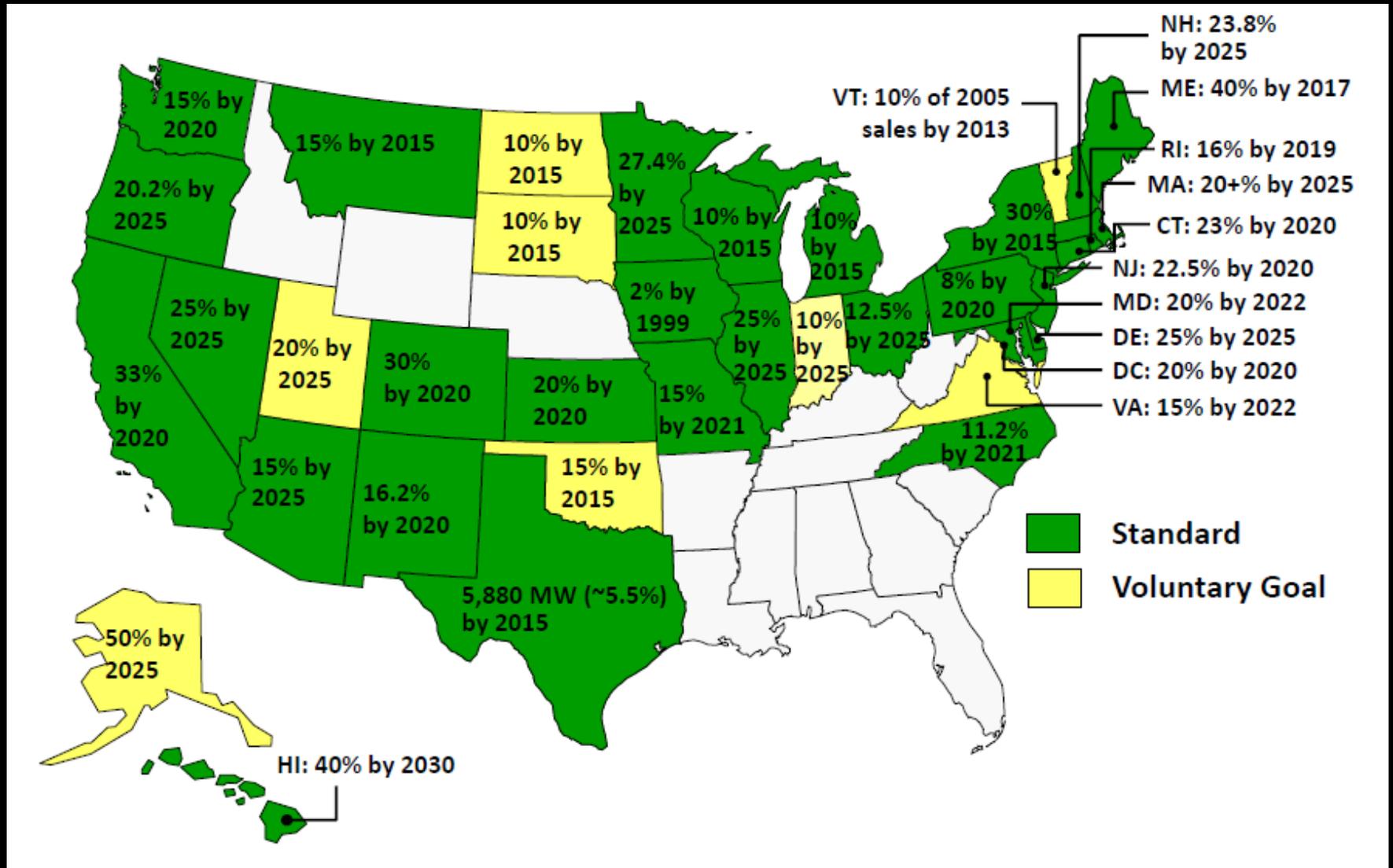
Governor's Renewable Energy Questions

Question 7: How does Michigan's renewable requirement compare to other states?

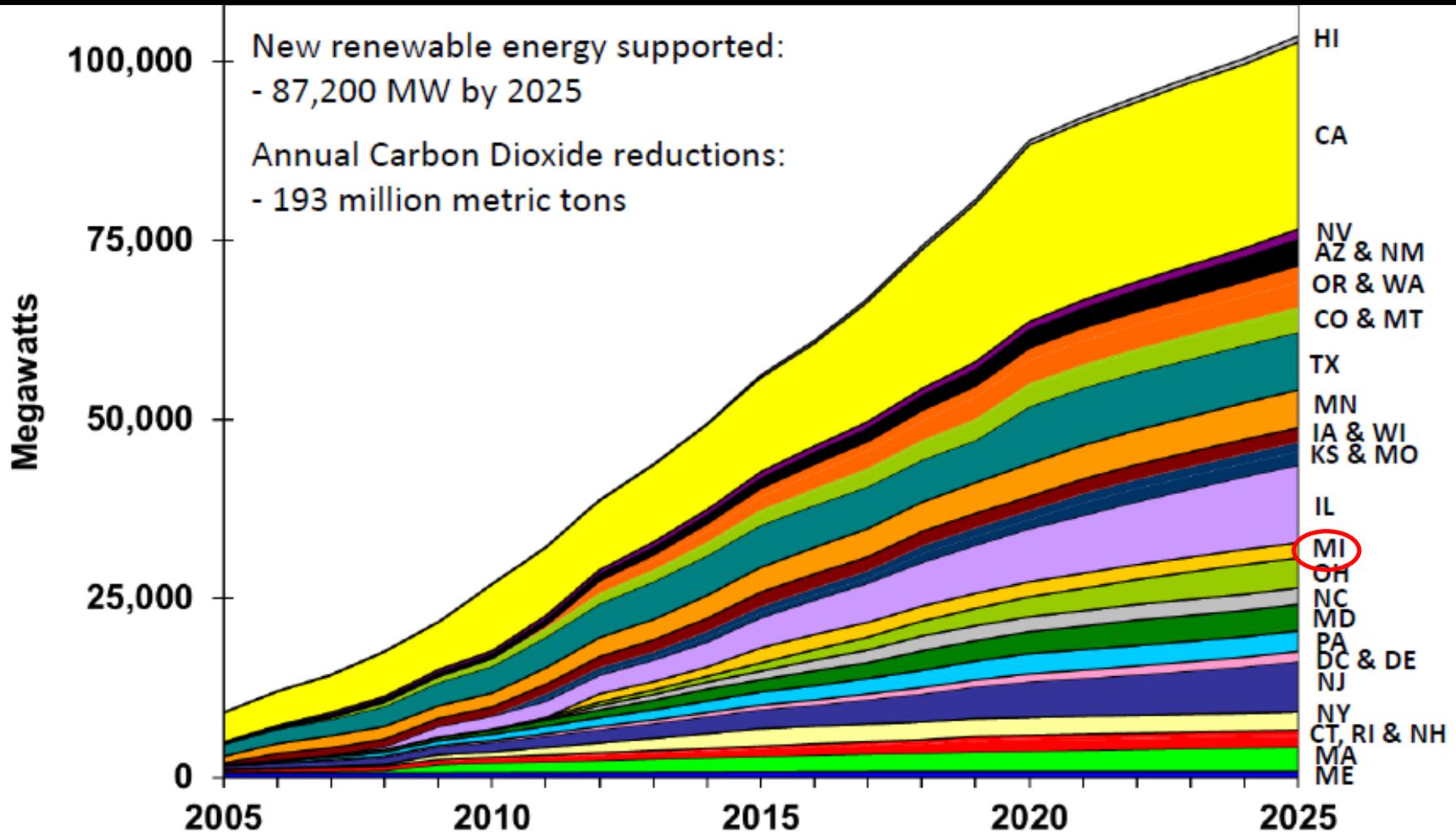
Question 8: What is Michigan's long-term potential for electricity from renewable resources?

Question 10: What are the current and projected relative costs of new generation sources?

Michigan's Current Renewable Electricity Standard Comparatively Modest



Renewable Energy Development Driven by State Clean Energy Standards Through 2025



*Projected development assuming states achieve annual renewable energy targets.

Assessing Michigan's Long-term Renewable Electricity Potential

Generation (GWh)	Technical Potential in Michigan ^a	Potential After Some Economic and Market Limitations	2012 Electricity Generation ^h
Solar (Photovoltaic)	5,290,013	38,261 ^b	~33
Wind - Onshore	143,908	143,901 ^c	1,108
Wind - Offshore	1,739,801	?	0
Bioenergy Total	11,897	14,687 ^d	2,448
Landfill Gas	1,108	1,108 ^e	878
Geothermal	457,850	1,289 ^f	~0
Hydropower	2,486 [*]	2,470 ^g	1,305
TOTAL	7,645,955	200,608	4,894

2012 State-Wide Electricity Generation: 106,609 GWh

Even after adjusting for economic and physical limitations, renewables have the potential to generate nearly twice Michigan's 2012 electricity demand—led primarily by onshore wind, solar, and bioenergy.

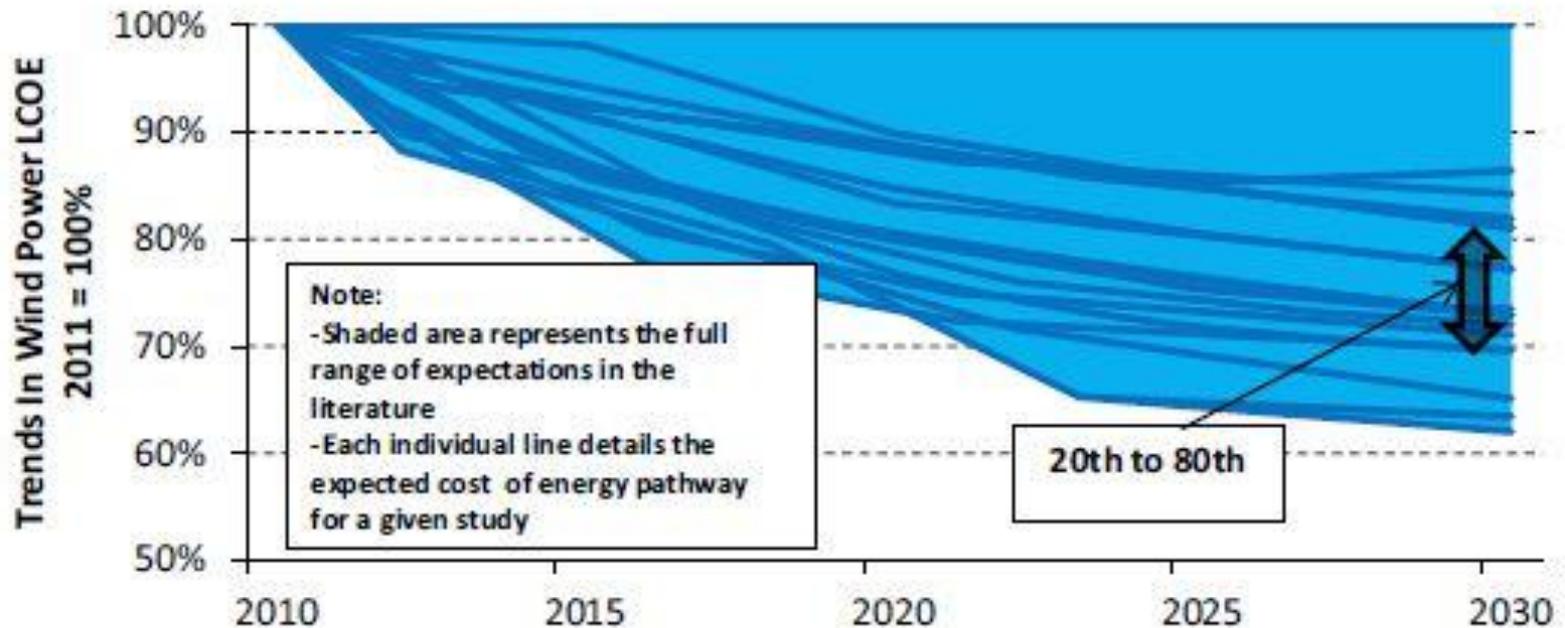
Ranking New Generation Options by Costs & Risks



Source: *Practicing Risk-Aware Electricity Regulation: What Every State Regulator Needs to Know*. 2012.

Wind Power Cost expected to Continue Declining Over Next 20 Years

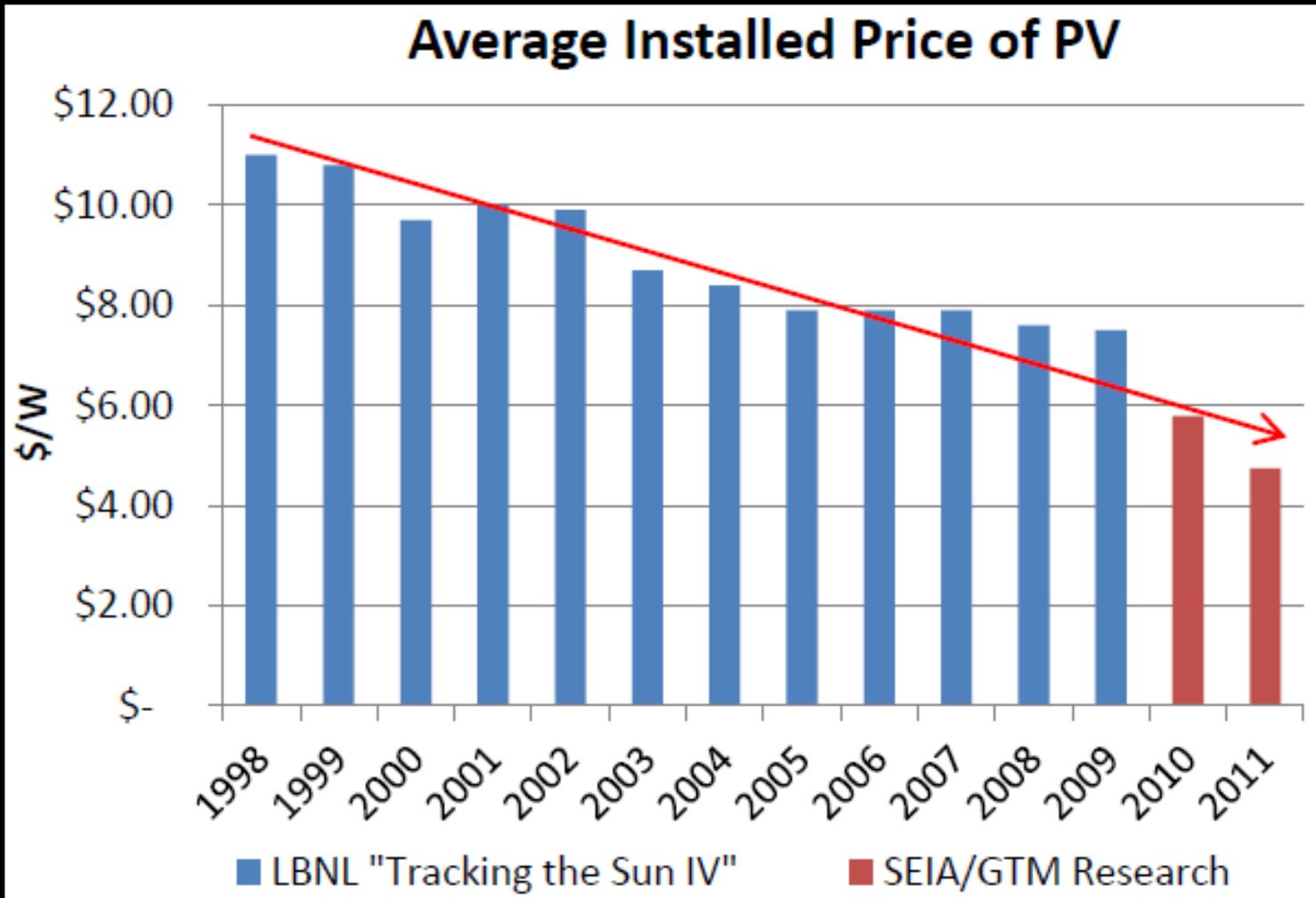
Figure 10. Estimated range of wind LCOE projections across 18 scenarios



Note:
- Shaded area represents the full range of expectations in the literature
- Each individual line details the expected cost of energy pathway for a given study

20th to 80th

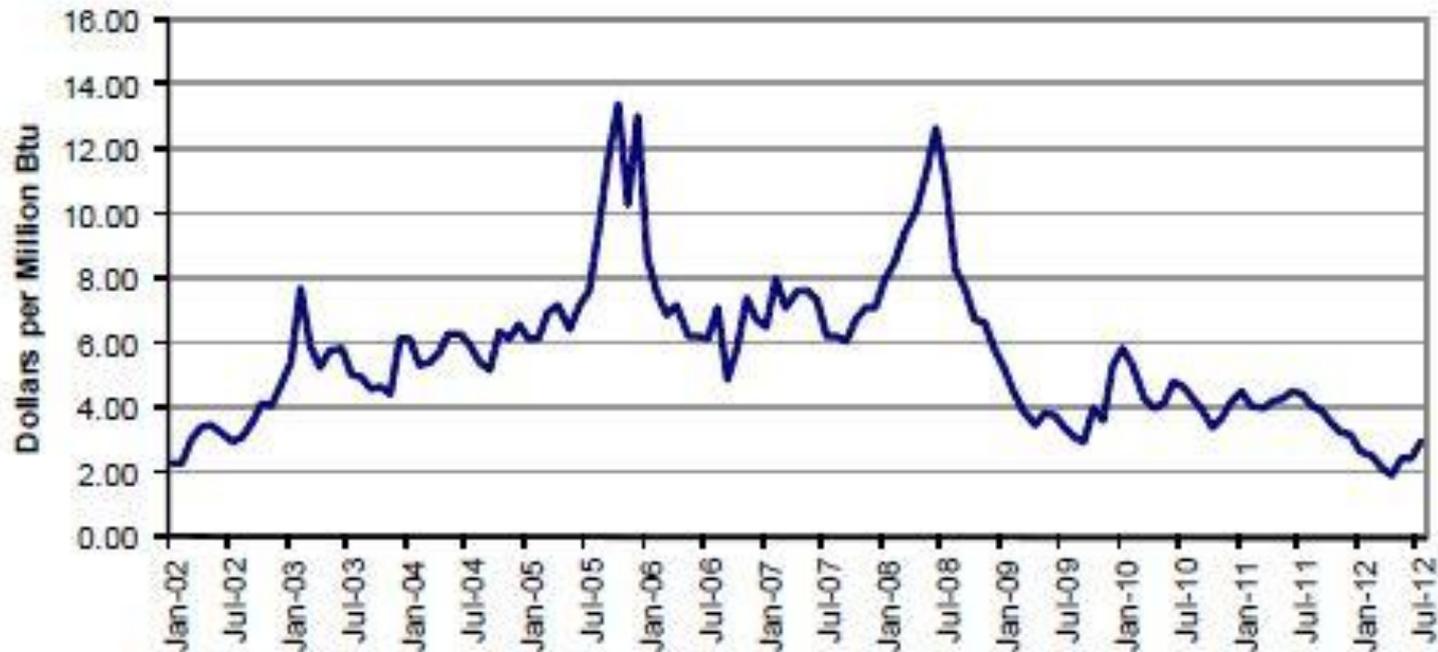
Declining Average Installed Price of Solar Photovoltaic Technology



Natural Gas Prices Are Historically Volatile

(Prices Since 2002)

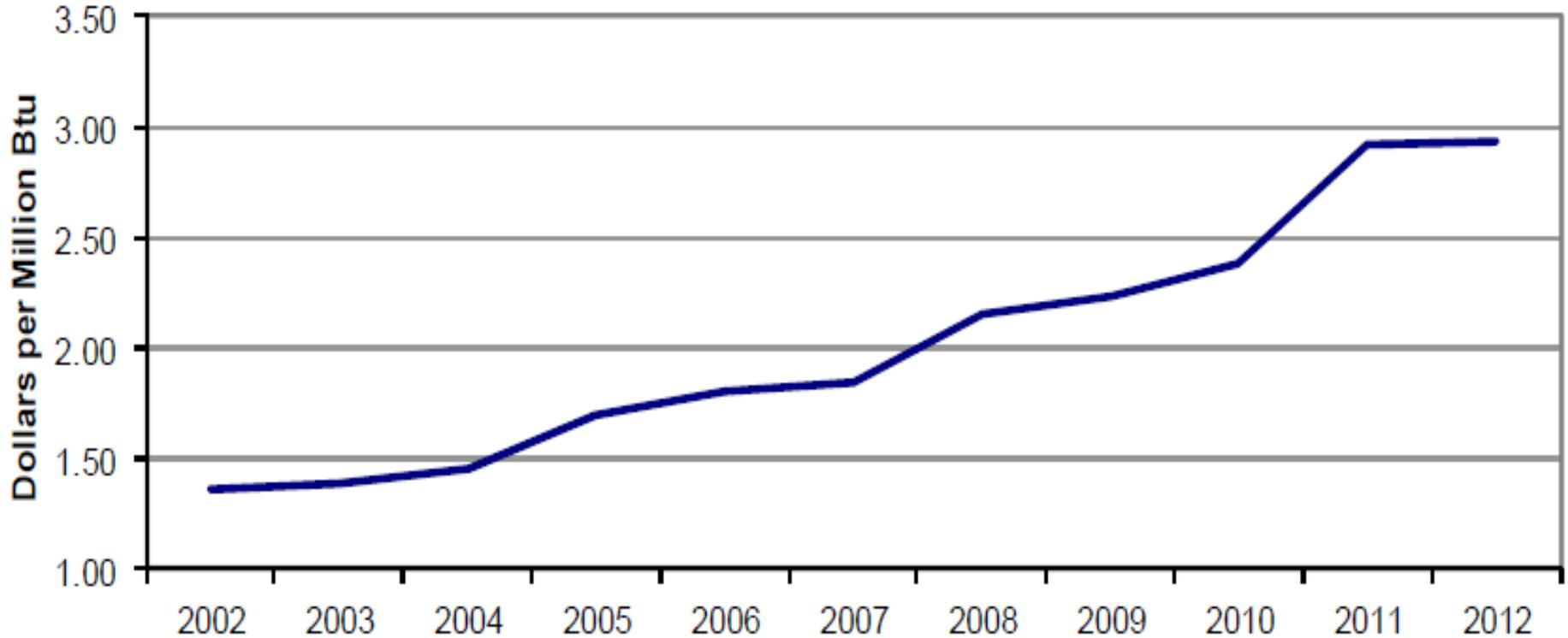
Recent Cost of Natural Gas



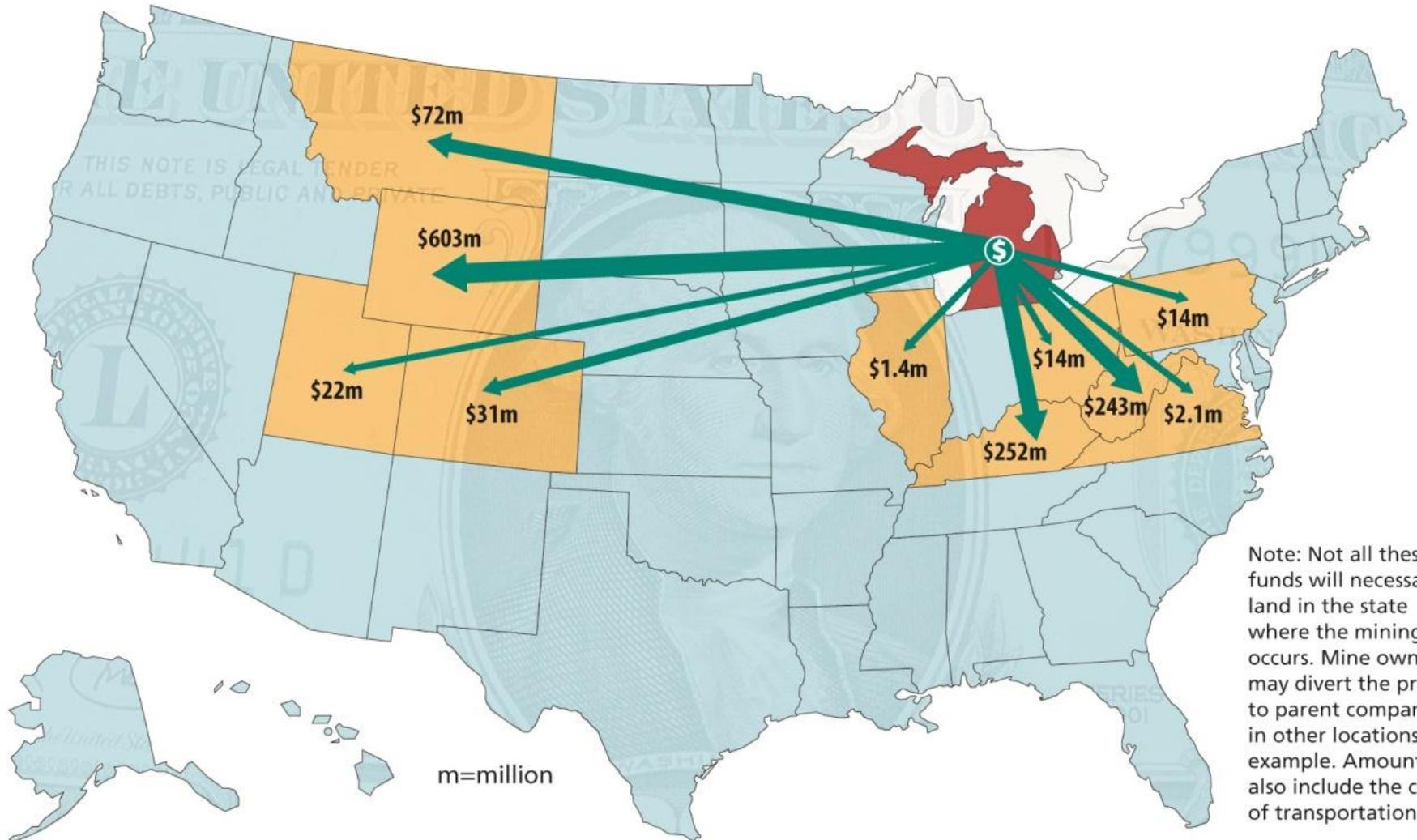
Source: U.S. Energy Information Administration (monthly data)

Michigan Coal Prices Doubled Since 2002

(Prices 2002-2012)



Michigan Spent \$1.3 Billion in 2010 to Import Coal from Other States

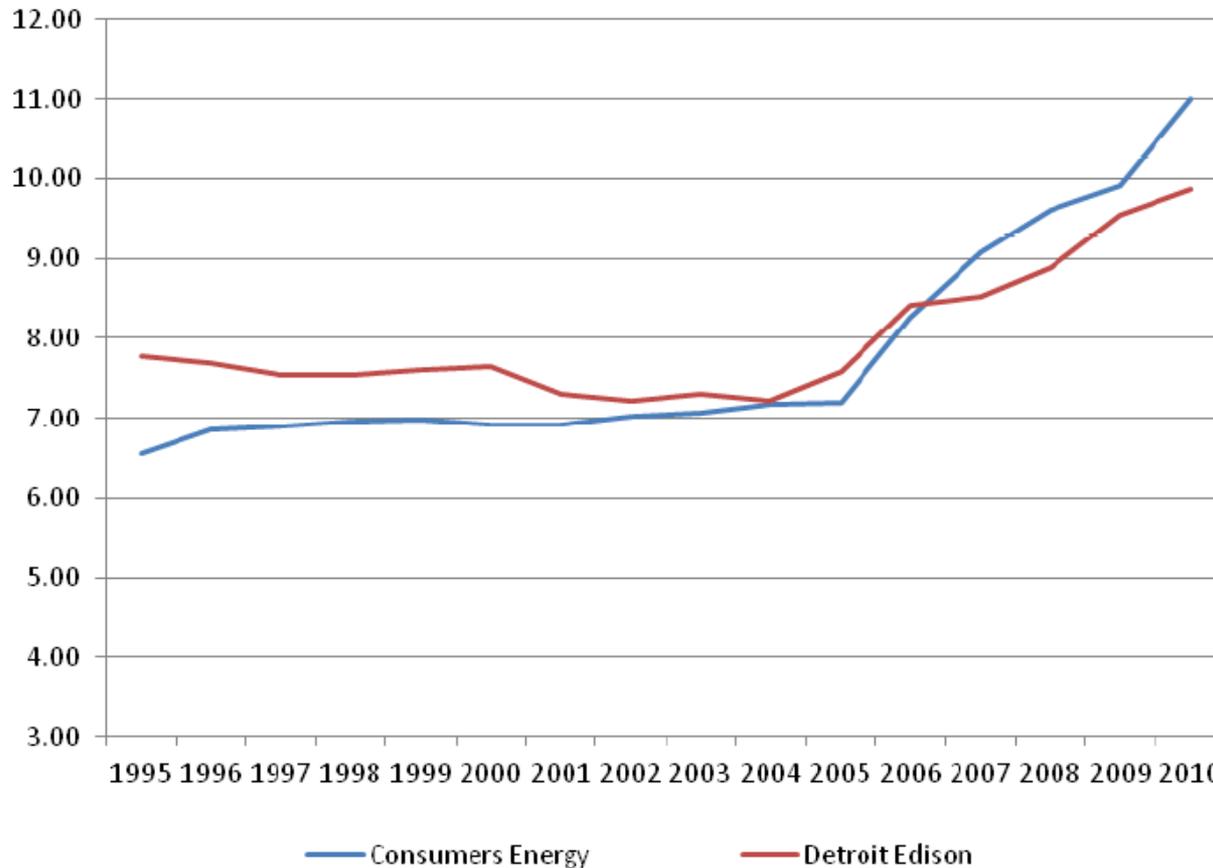


Note: Not all these funds will necessarily land in the state where the mining occurs. Mine owners may divert the profits to parent companies in other locations, for example. Amounts also include the cost of transportation.

Rising Electricity Rates

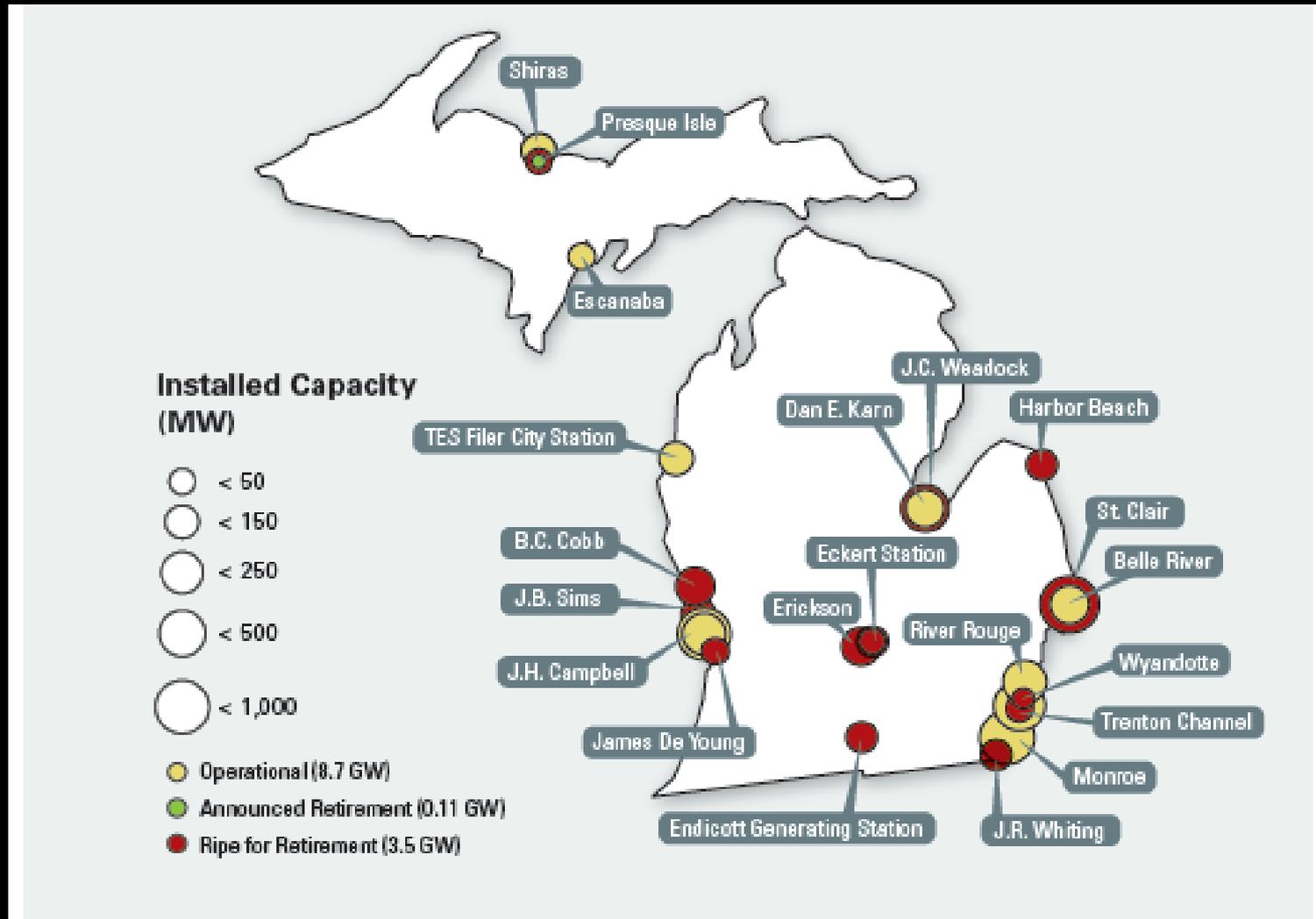
(Consumer and DTE Rates 1995-2010)

Figure 13. Average Electricity Rates, Consumers Energy and Detroit Edison



Source: MPSC Statistical Data of Total Electricity Sales

3.5 Gigawatts of Ripe-for-Retirement Coal Generation in Michigan (5th most in the U.S.)



What the Numbers are Telling Us

- Michigan's current RES is modest, even when compared with other state policies in the Midwest.
- There are enough renewable energy resources in Michigan alone to generate electricity above and beyond Michigan's current demand.
- When considering both cost and risk, renewable energy and energy efficiency are sound investments for meeting Michigan's energy needs.
- Michigan can realize additional benefits by also considering the environmental and public health benefits of relying more on clean energy resources.