



Public Service Commission

Energy, Labor & Economic Growth

Electric Utility Interconnection, Net Metering & Feed-in-Tariff Michigan Update

Presentation Available @
www.michigan.gov/rendocs

Julie Baldwin, Staff Engineer 517 241-6115

baldwinj2@michigan.gov

Jesse Harlow, Staff Engineer 517 241-8793

harlowj@michigan.gov

Renewable Energy Section
Michigan Public Service Commission

June 24, 2010

MPSC Background

- Michigan Public Service Commission
 - Three Governor-appointed Commissioners
 - Regulates 16 investor-owned and cooperative (member owned) utilities
 - Regulatory responsibilities for distribution-level electric utility interconnections and the new Renewable Energy Standard (RPS) & net metering program



Electric Utility Interconnection

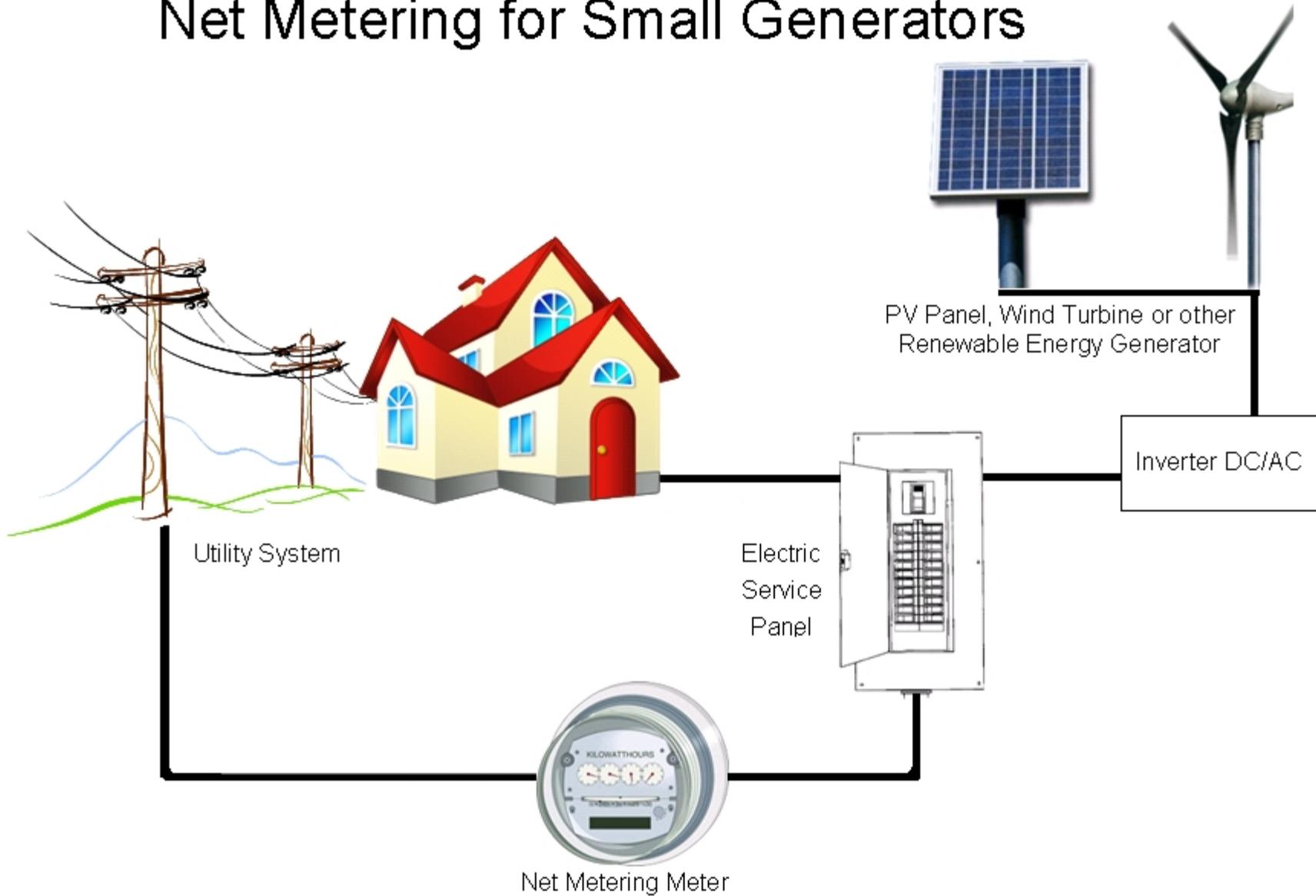
- MPSC regulates the distribution level interconnection process
- Interconnections at the transmission level are handled by the Federal Energy Regulatory Commission (FERC)



Interconnection Process
Category 1 – 20 kW and less,
inverter based, UL certified projects

1. Select generator and project installer
2. Complete and submit interconnection application to electric utility with filing fee
\$75 for interconnection & \$25 for net metering
3. Receive application approval from electric utility
4. Receive and review the Interconnection Agreement from electric utility
5. Install your project according to applicable codes and standards
6. Complete the local inspection
7. Utility meter installation, final inspection & testing, final approval from electric utility
8. **Start generating your own electricity!**

Net Metering for Small Generators



New PA 295

Net Metering Program

Background & Highlights



Where we were...Pre-Act 295

- No explicit legislative authority to establish a net metering program
- 2005 program was designed using a voluntary collaborative process
- Very complicated billing – generally not “net” metering for most utilities
- Billing, metering requirements, agreements were not standard across participating utilities
- Low customer participation and satisfaction

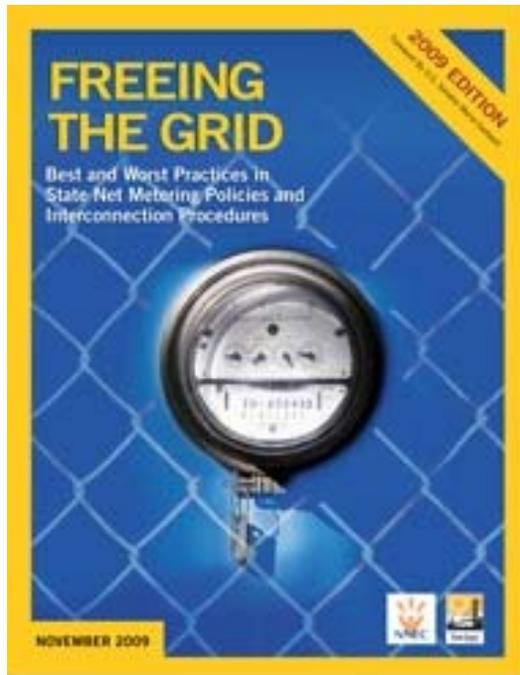


With Act 295...Much Improved Program

- Excellent program for small generator projects
- Increased customer interest
- Expands program with a “modified” net metering offering for renewable generators up to 150 kW and methane digesters up to 550 kW
- Standard application and agreement
- See www.michigan.gov/netmetering



Net Metering State “Grade”



- *Freeing the Grid* 2009 Edition awards Michigan a “B” grade for new net metering program
 - Improved from an “F” (in 2007 & ’08)
 - Michigan now ranks 15th of 44 states with graded net metering programs
- www.freeingthegrid.com

Status of Electric Interconnection & Net Metering Standards

- New Electric Interconnection & Net Metering Standards implementing Act 295 became effective on May 27, 2009
- Uniform, statewide application forms & contractual agreement forms
- www.michigan.gov/customergeneration

Net Metering

Small Projects 20 kW and Under

- Generally, residential customer projects
- Customer is billed based on net usage
- Customer receives a credit equal to the full retail rate for all excess kWh
- Credit is applied to kWh charges in future months and unused credits carry forward indefinitely
- Customer will pay monthly customer charge or system access fees
- No study, testing/inspection or interconnection fees
- Generally approved in under 14 days

Modified Net Metering

Projects from > 20 kW to 150 kW

- Typically, agricultural, commercial, industrial, or institutional customer projects
- Customers pay the full retail rate for electricity deliveries from their electric provider and are credited at the generation portion of the retail rate or a wholesale rate for deliveries of excess generation to the grid
- No charge for the engineering review for interconnection
- Customers pay all interconnection costs, distribution study fees and any required distribution system upgrades
- Customers with generators up to 150 kW can use their generation on-site (behind the meter) without paying a standby charge

Modified Net Metering Methane Digester Projects

- Typically, on-farm projects
- For projects >150 kW up to 550 kW
- Nearly the same as the >20 kW to 150 kW program
- Customers pay the costs of any additional meters, plus “standby charges” equal to imputed distribution charges as if they bought all their energy from the utility

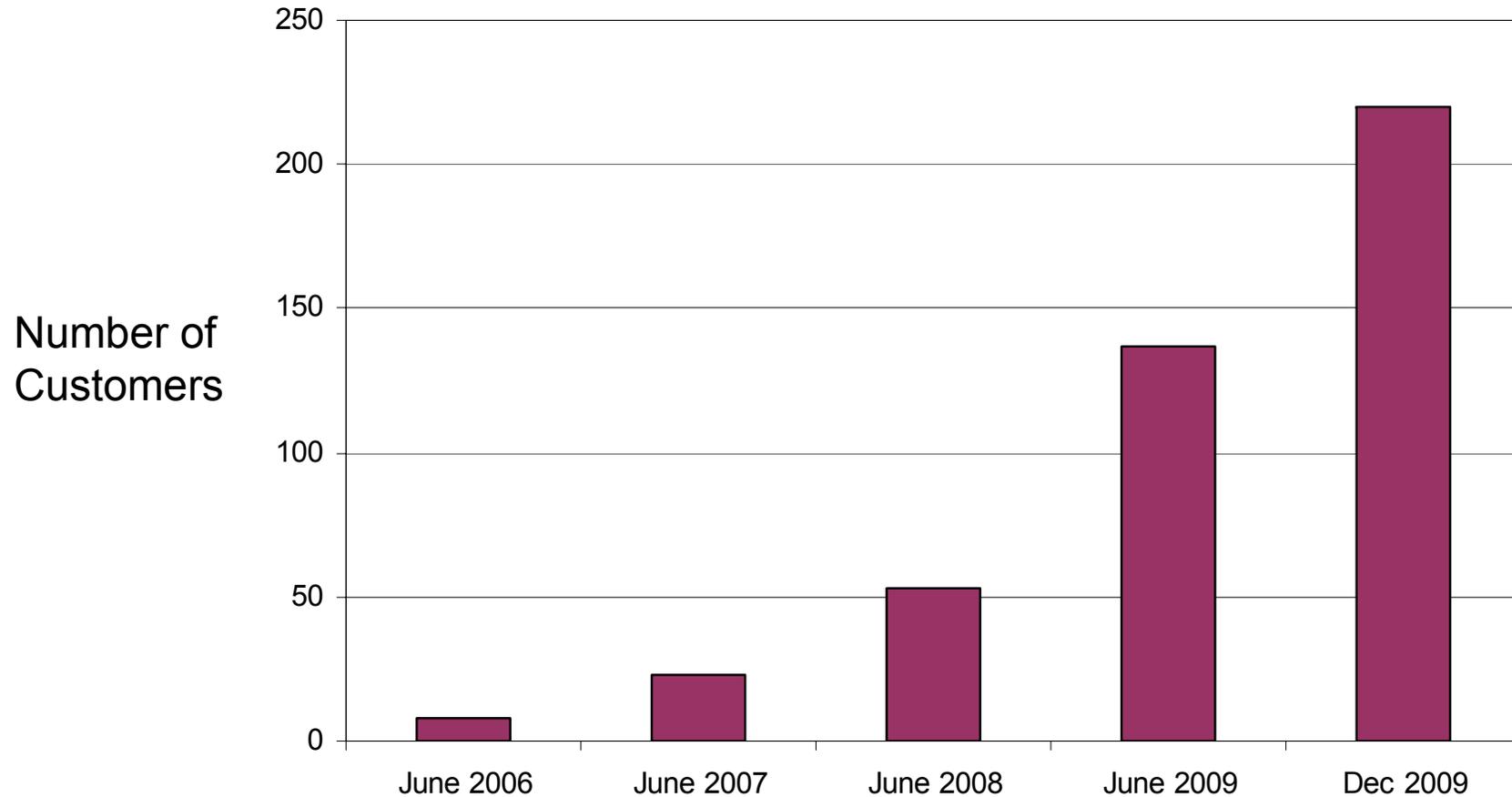
Summary of Michigan Interconnections Projects Completed by Generator Size

Types of Energy	Number of Projects	20 kW and under	>20 kW to 150 kW	>150 kW to 550 kW	>550 kW to 2 MW	>2 MW
Wind	135	133	1	0	0	1
Solar	78	78	0	0	0	0
Other*	21	0	4	0	5	12
Total	234	211	5	0	5	13

Other category includes: landfill gas, dynamometers, diesel & methane digesters
Data includes projects from approximately 2005 until September 30, 2009.

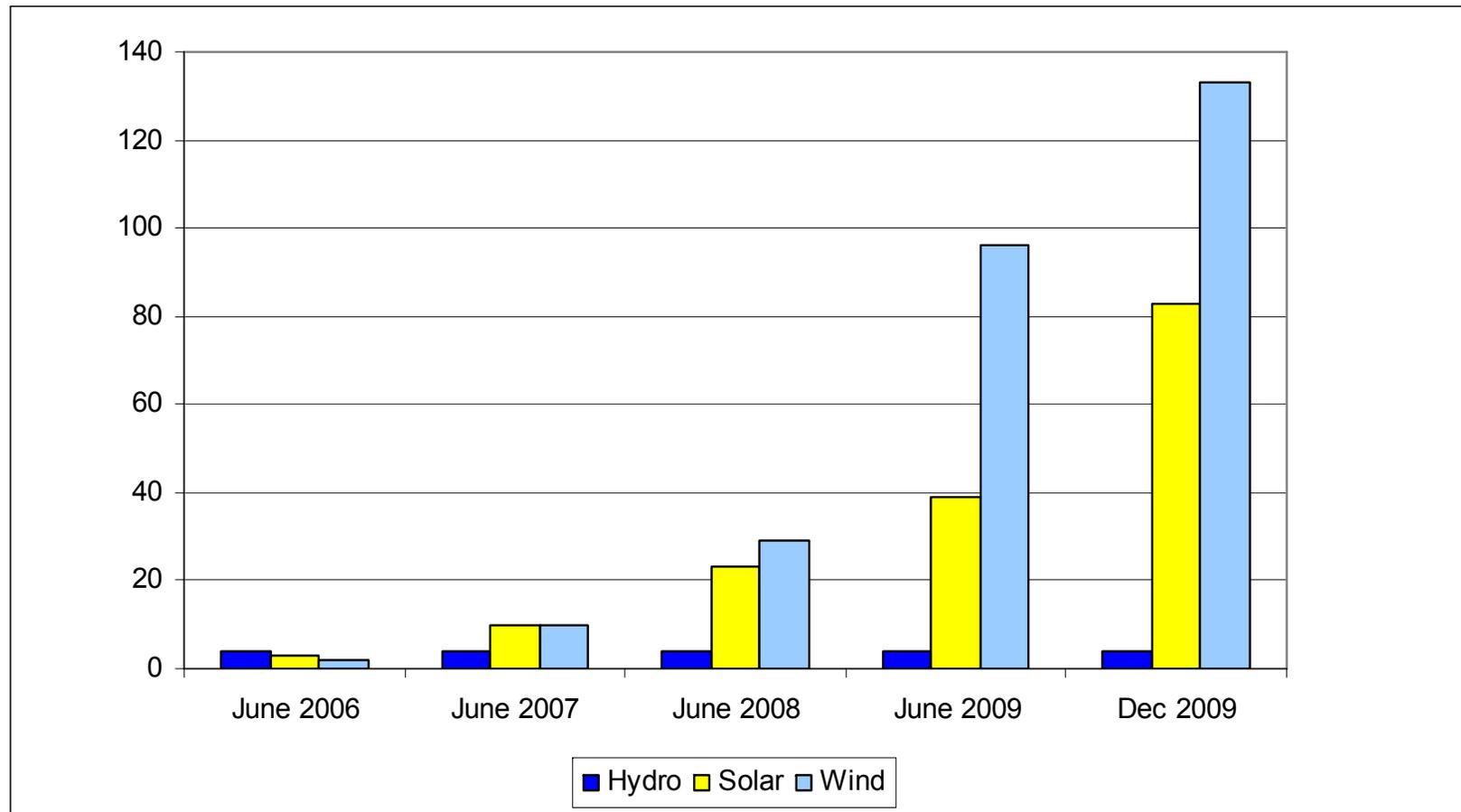
MPSC-regulated providers only. Does not include municipal utilities or member-regulated cooperatives.

Michigan Net Metering Cumulative Installations - December 2009



Michigan Net Metering - by System Type

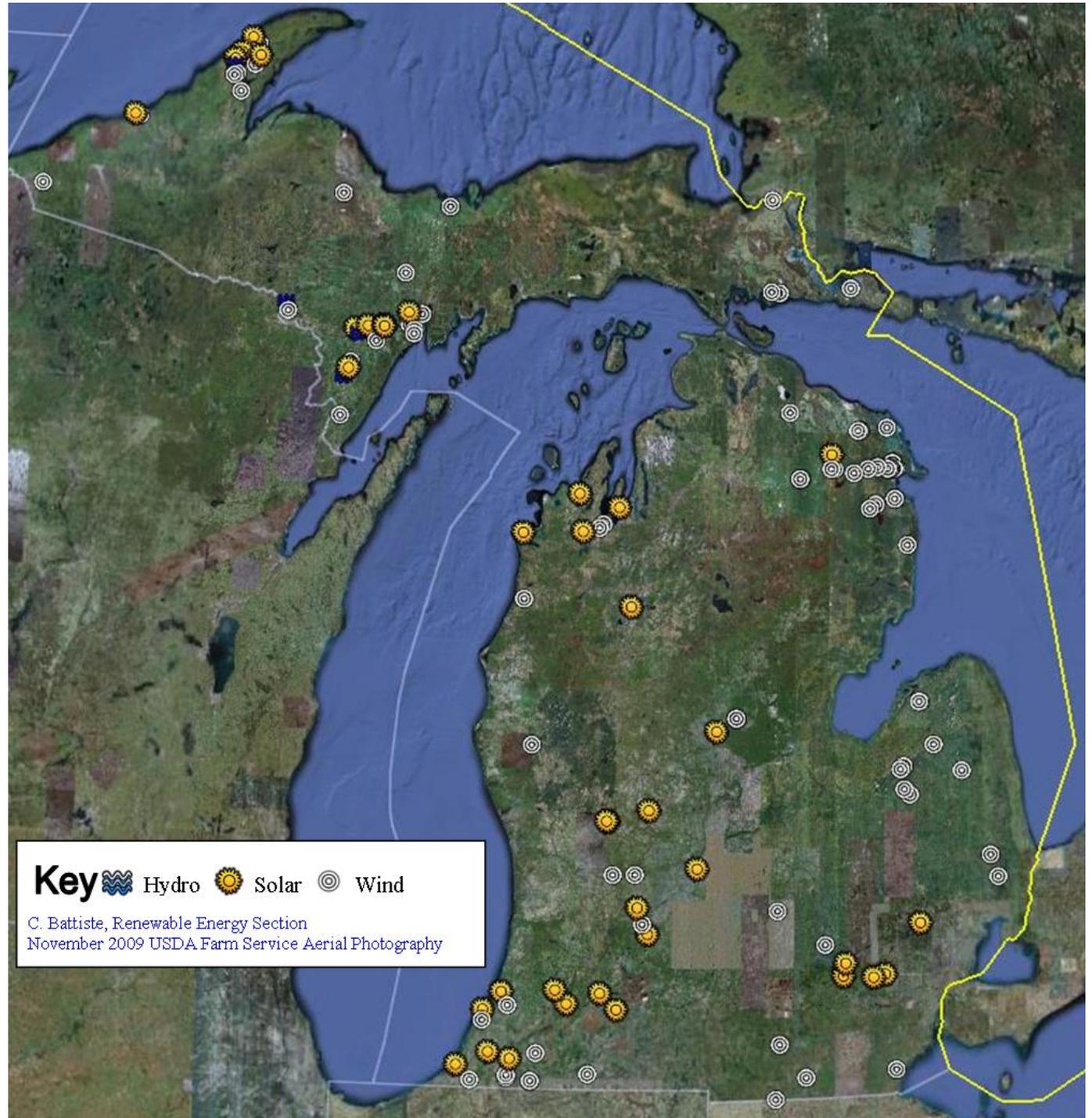
December 2009



Public Service Commission
Energy, Labor & Economic Growth

Locations of Michigan Net Metering Customers

(Cumulative installations through June 30, 2009, by Zip Code)



Experimental/Pilot Programs for Small-Scale, Distributed Renewable Generation Supporting Michigan Utility PA 295 RPS Plans



Detroit Edison

SolarCurrents Pilot Program

- Available to Detroit Edison retail net metering customers
- Limited to 5 MW capacity; solar PV only; At least half reserved for residential customers
- Contract term of 20 years
- Up-front payment of \$2.40 per watt (estimated 25% of total system cost, including modest ROI) plus annual payments of 11¢/kWh for RECs (estimated ~25% of total system cost).
- Net metering program allows customer to receive an economic value of remaining 50% cost
- Estimated \$25 million program, out of \$2.2 billion total
- www.dteenergy.com/solar

Consumers Energy Experimental Solar Program

- Participating customers may not enroll in net metering
- Limited to a total of 2 MW of solar PV, 500 kW reserved for residential customers
- Estimated \$10 million program, out of ~\$3.1 billion, 20-year spending on renewable energy
- Prices paid range from \$0.65/kWh to \$0.375/kWh
- RECs belong to the utility
- Contract term is up to 12 years

Feed-In Tariff Definition

- **Feed-in Tariff (FIT)***: A renewable energy policy that typically offers a guarantee of:
 1. **Payments** to project owners for the total amount of renewable electricity they produce;
 2. **Access to the grid**; and
 3. **Stable, long-term contracts** (15-20 years)
- **This revenue may pay for:**
 - Electricity sales, or
 - Electricity sales + RECs
- * Also called fixed-price policies, minimum price policies, standard offer contracts, feed laws, renewable energy payments, renewable energy dividends and advanced renewable tariffs.



FIT vs. Quotas (RPS)

Quota models, like Michigan's Renewable Portfolio Standard, mandate growth rates and let the market set the price.

- **Pros**
 - Mandatory introduction of renewables into energy infrastructure.
- **Cons**
 - Technology biased in that “cheap” technology is chosen first.
 - Delayed costs: Prices accelerate after “cheap” technology has fully saturated market.

ART models set price and let the market determine growth.

- **Pros**
 - Small manufacturers are profitable and able to compete encouraging early breakthrough development that could potentially help lower the cost of these technologies. “Learning Curve”
 - Guarantees investments, easing lender worry.
- **Cons**
 - Can provide unnecessarily high payback if not adjusted according to market.

Some researchers believe the most efficient policy will be one that combines FIT and Quotas



Goals & Objectives: Whose? Which? for Whom, What, Where, When, & How?

- Compliance cost savings
- Encouraging resource diversity and securing opportunities for small-scale systems
- Offering standard contracts, for simplicity sake
- Faster (optimum?) growth in RE production and use
- Support manufacturing attraction efforts



Existing North American FITS:

Vermont

- Sustainably Priced Energy Development Program (SPEED)
- Program launched September 30, 2009
- Prices range from \$0.12 for biogas up to \$0.30 for small solar.
- Program cap of 2.2 MW for individual systems and 50 MW total (4.4% of 2008 capacity).
- 20-year contracts
- <http://vermontspeed.com/standard-offer-program/>
- Program oversubscribed on first day



Existing North American FITs:

Ontario, Canada

- Program launched Sept 24, 2009
- Prices (in Canadian \$) range from \$0.104 for biogas and up to \$0.802 for small solar
- Open, unlimited participation, 20-year contracts
- <http://fit.powerauthority.on.ca/>
- \$9 billion of contracts just signed
- 694 large and midsize contracts signed to date representing 2530 MW (8% of total capacity)
- 3000 microFiT (10 kW or less) conditionally approved
 - 8424 applications received totaling 76 MW



Existing North American FITs:

Gainesville, Florida

- Program launched March 1, 2009. Filled by April 2009.
- Limited to Solar from \$0.19-\$0.32 depending on contract year and panel mounting.
- Program cap of 4 MW (~1% of total)
- 20-year contracts.
- www.gru.com/OurCommunity/Environment/GreenEnergy/solar.jsp
- Capacity “maxed out before program begins”
- To be revisited for 2011...



Existing North American FITs:

California

- Program initially approved September 2006; most recently amended October 2009.
- Available to generators (up to 3 MW) in service territory of all investor owned utilities and publicly owned utilities with 75,000 or more customers.
- Rates range from \$0.08-\$0.31, depending on time of generation using CPUC market-price referent table. Higher rate for solar generating between 8 a.m. & 6 p.m.
- 10-, 15-, and 20-year contracts.
- <http://www.cpuc.ca.gov/feedintariff>



Existing North American FITs:

Oregon

- July 2009, Oregon legislation establishes pilot feed-in-tariff for solar PV systems.
 - Aggregate capacity for pilot program is 25 MW (0.2% of 2008 capacity), with individual system limit of 500 kilowatts (kW).
 - Oregon PUC must still devise final rules. Same bill (HB 3039) also created a multiplier for solar in Oregon's RPS, and requires electric utilities to develop 20 MW of solar PV by 2020.
- www.leg.state.or.us/09reg/measpdf/hb3000.dir/hb3039.en.pdf



Existing North American FITs:

Georgia Power

- Green Power Program revised in July 2009.
- Georgia power buys solar PV generation at \$0.1831/kWh.
- 1.5 MW program cap (<0.001% of total).
- RECs are transferred to utility.
- <http://www.generationpartners.com>



Existing North American FITs:

Hawaii

- Order filed on September 25, 2009 by Hawaii's PUC in Docket #2008-0273
- For all 3 investor owned utility service territories
- Rates will be set in "phase 2"
- Individual system cap up to 5 MW
- Program cap is 1% of each island's load.
- <http://www.dsireusa.org/documents/Incentives/HI29F.pdf>



Actively Considering FIT Wisconsin

- Numerous Wisconsin Utilities have proposed FITs to the Public Service Commission of Wisconsin (PSCW)
- At least two have modest experimental net metering + green rate FITs
- January 2009 PSCW opened docket #5-EI-148 to investigate ARTs
- <http://www.dsireusa.org/documents/Incentives/WI57F.pdf>



Introduced FIT Legislation

- Washington – HB 1086 introduced January 8, 2009
 - apps.leg.wa.gov/documents/billdocs/2009-10/Pdf/Bills/House%20Bills/1086.pdf
- Minnesota – HF 3537 introduced February 28, 2008
 - www.revisor.mn.gov/bin/bldbill.php?bill=H3537.0.html&session=1s85



Introduced FIT Legislation (2)

- Illinois – HB 5855 introduced March 14, 2008
 - www.ilga.gov/legislation/96/HB/PDF/09600HB5855lv.pdf
- Rhode Island – H 7616 introduced February 26, 2008
 - www.rilin.state.ri.us/billtext08/housetext08/h7616.htm
- **Federal Legislation** – H.R. 6401 (Inslee Bill) introduced June 26, 2008,
entitled *Renewable Energy Jobs and Security Act*



Actively Considering FIT Michigan

- Michigan – HB 4137 introduced February 4, 2009 Spondored By Representative Gonzales
 - www.legislature.mi.gov/documents/2009-2010/billintroduced/House/pdf/2009-HIB-4137.pdf
- Representative Gonzales to introduce substitute FIT bill
- Reprsentative Huckleberry to introduce open FIT bill



For the future?

Two Scenarios to Consider

- ① Work within existing RPS, to meet RPS compliance goals at lower cost
- ② Unconstrained German- or Ontario-Style



FIT Policy Details TBD

- Price setting method (cost of generation, value to utility system, or hybrid)
- Tariff differentiations (technology type, system size, resource quality, location)
- Further differentiations or eligibility criteria to encourage specific qualities (e.g., peak production, C-BED, energy efficiency, brownfield redevelopment, CHP)



FIT Policy Details TBD (2)

- Tariff degression & adjustments for resource quality
- System eligibility, vintage
- Contract duration
- Electric supplier purchase obligation, interconnection & grid access priority
- Interconnection cost sharing
- Source of subsidies (ratepayers, taxpayers)



FIT Policy Details TBD (3)

- Program Caps By:
 - Program
 - Utility/supplier
 - Individual project size
 - Technology type
 - Ownership
 - Location



Learn more about FITs

- Mendonca, Miguel (for World Future Council). *Feed-In Tariffs: Accelerating the Deployment of Renewable Energy*. London: Earthscan, 2007; www.earthscan.co.uk/?tabid=298.
- Hempling, Scott, et al. *Renewable Energy Prices in State-Level Feed-in Tariffs: Federal Law Constraints and Possible Solutions*. National Renewable Energy Laboratory, 2010; TP-6A2-47408; www.nrel.gov/analysis/publications.html.
- Cory, Karlynn, Couture, Toby, Kreycik. *Feed-in Tariff Policy: Design, Implementation, and RPS Policy Interactions*. National Renewable Energy Laboratory, 2009. <http://www.nrel.gov/analysis/publications.html>.
- MI-FIT@googlegroups.com



Questions?

Julie Baldwin, Staff Engineer

baldwinj2@michigan.gov

517 241-6115

Jesse Harlow, Staff Engineer

harlowj@michigan.gov

517 241-8793

Renewable Energy Section
Electric Reliability Division
Michigan Public Service Commission



Public Service Commission
Energy, Labor & Economic Growth

