Michigan’s Renewable Energy Sources Act (HB 5218 2007)
Michigan’s Renewable Energy Sources Act

- Rapid Sustainable Development of RE
- Reduce Electricity Price Volatility
- Reduce Long-Term Electricity Prices
  Pay Little More Now
to Avoid Paying Much More Later
- Reduce Greenhouse Gases
- Create New Jobs

Paul Gipe, wind-works.org
Michigan’s Renewable Energy Sources Act

Key Features

• Priority Access to the Grid
• Priority Purchase of Renewable Energy
• Fixed Prices (Tariffs)
• Open to All
• Independent of Electric Utilities
• Independent of Federal Subsidies
• First of Its Kind in USA

Ontario First in North America

Paul Gipe, wind-works.org
Michigan’s Renewable Energy Sources Act

- All Renewables
- HB 5218 (2007) Open to All
- Term: 20 Years
- Differentiated Tariffs for Wind
- Small Wind Tariff
- Differentiated Tariffs for PV
- Tariffs Reduced with Federal Subsidy
Michigan’s RESA Background

• From Successful German Policy
• Policies Used in France, Spain, and other Countries
• Trend Toward Similar Policies in NA
  Ontario
  Related Policies in WA & CA
Why the European Success?

• #1 Community Involvement
  Germany & Denmark

• #2 Advanced Renewable Tariffs
  16 EU Countries use Electricity Feed Laws

Paul Gipe, wind-works.org
Solar PV in Germany 2006

- 100,000 New Systems
- €4 Billion
- Total of 300,000 Systems
- ~1,000 MW in 2006!
- Total 2,500 MW
- Costs Dropped 25%
- 300 MW by Farmers!
  On Barn Roofs, 35 kW each

Paul Gipe, wind-works.org
Renewable Tariffs & Solar Photovoltaics in Germany

Year

MW Total

Renewable Tariffs Launched

1,000-Rooftops (2,500 x 3kW)

100,000 Rooftops

Paul Gipe, wind-works.org
German Farms . . .

. . . Solar PV Cash Crop

- 300 MW on Barn Roof Tops in 2006
German Granny Flat
What’s Wrong with This Picture?

Paul Gipe, wind-works.org
Near Freiburg, Germany
Schönau, Germany

German Churches . . .
. . . Protecting Creation

Paul Gipe, wind-works.org
Germany’s Renewable Tariffs
The Results (2006)

• Renewables 11.5% of Supply
• Renewables 5.3% of Primary Energy
• 70,000 Employed in Wind Industry
• 40,000 Employed in PV Industry
• 8,000 Employed in Biogas Industry
• 214,000 Employed in Renewables
• €22 (~$30) Billion Turnover

Paul Gipe, wind-works.org
## Wind Energy Tariffs
### European Job Creation Engine

<table>
<thead>
<tr>
<th>Europe</th>
<th>Direct</th>
<th>Indirect</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td>7,500</td>
<td>37,500</td>
<td>45,000</td>
</tr>
<tr>
<td>Denmark</td>
<td>8,600</td>
<td>4,300</td>
<td>13,000</td>
</tr>
<tr>
<td>Spain</td>
<td>7,000</td>
<td>15,000</td>
<td>22,000</td>
</tr>
<tr>
<td>Total</td>
<td>80,000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Enercon, Aurich, Germany
Germany’s Renewable Tariffs
The Results (2006)

• 300,000 PV Installations
• 2,000 Biomass Plants
• 550 MW Farm Biogas, 10 TWh/yr
• 6,000 Hydro Plants
• 18,000 Wind Turbines
• Total of ~350,000 Generators!

Paul Gipe, wind-works.org

DeWind
Cost of German EEG

- Generation: 60%
- EEG: 3%
- Concession: 10%
- CHP Act: 2%
- Eco Tax: 11%
- VAT: 14%

Paul Gipe, wind-works.org
Installed Wind Capacity 2006
Where Michigan Stands

- Texas
- California
- Ontario
- Pennsylvania
- Illinois
- Wisconsin
- Michigan

Megawatts

Paul Gipe, wind-works.org
Installed Solar Capacity 2006
Where Michigan Stands

- California
- New Jersey
- Arizona
- New York
- Illinois
- Massachusetts
- Michigan

Megawatts

Paul Gipe, wind-works.org
Michigan

• More Like Germany than Texas
  
  Population Density
  Farm Size
  Settlement Patterns

• Projects More Like Germany than Texas?
  
  Smaller Projects
  Clusters of Turbines
  Single Turbines

Paul Gipe, wind-works.org
Michigan’s RESA Tariffs (Payments/kWh)

- Directly from German RESA
- Currency Conversion March 2007
- USD Rates Much Higher Today
- Rooftop Solar PV <30 kW: $0.70/kWh

Paul Gipe, wind-works.org
Michigan’s RESA Tariffs (Payments/kWh)

- Hydro <500 kW: $0.10/kWh
- Biogas <150 kW: $0.145/kWh
- Geothermal <5 MW: $0.19/kWh
- Wind Base Tariff: $0.105/kWh
- Wind SWT: $0.25/kWh
- Rooftop Solar PV <30 kW: $0.65/kWh
- Solar façades <30 kW: $0.71/kWh

Paul Gipe, wind-works.org
Advanced Renewable Tariffs

• Deliver More Capacity--
  --More Quickly
  --More Equitably

Paul Gipe, wind-works.org
Market Mechanism Status

- **Premium Prices (Renewable Tariffs)**
  Typically Non-Anglophone Countries
  Aggressive Targets

- **Quotas (RPS & Tendering)**
  Typically Anglophone Countries
  Timid Targets Seldom Met

Paul Gipe, wind-works.org

Haverigg, Cumbria, Britain
Aggressive Targets Require Aggressive Measures

German Renewable Energy Targets

<table>
<thead>
<tr>
<th></th>
<th>2010</th>
<th>2020</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity</td>
<td>12.5%</td>
<td>27%</td>
<td>45%</td>
</tr>
</tbody>
</table>

Paul Gipe, wind-works.org
Renewable Tariffs: Trend Growing in North America?

Paul Gipe, wind-works.org

Husum, Germany
Renewable Tariffs in North America . . Unthinkable?

- Yes--Just 3 years ago
- Today? No
- Now Possible
- Growing Trend in both USA & Canada

Paul Gipe, wind-works.org
Gaspé, Quebec
Evolution of Market Mechanisms

• ARTs Developing Momentum
• RPS/Quota May Have Peaked

Exemplars Weakening
California?
Britain?

Paul Gipe, wind-works.org
Michigan’s Renewable Energy Sources Act

No Time for Half Measures

No Time to Lose

Paul Gipe, wind-works.org