Disclaimer: The views expressed are those of Paul Gipe and are not necessarily those of the sponsor.

Disclosure: Paul Gipe has worked with Aerovironment, ANZSES, APROMA, ASES, AusWEA, AWEA, BWEA, BWE, CanWEA, Canadian Co-operative Assoc., CAW, CEERT, DGW, DSF, EECA, ES&T, GEO, GPI Atlantic, IREQ, KWEA, MADE, Microsoft, ManSEA, MSU, NRCan, NRG Systems, NASA, NREL, NZWEA, ORWWG, OSEA, Pembina, PG&E, SeaWest, SEI, TREC, USDOE, WAFFWG, WE Energies, the Folkecenter, the Izaak Walton League, the Minnesota Project, the Sierra Club, and Zond Systems, and written for magazines in the USA, Canada, France, Denmark, and Germany.
Farm Power: Renewable Tariffs for a Rural Revolution

by

Paul Gipe
Renewable Energy Has Come of Age

Noordoost polder, the Netherlands

Paul Gipe, wind-works.org
Montefalcone, Italy
Galicia, Spain

Paul Gipe, wind-works.org
Freiburg -- Germany’s Solar City
2009 World Wind Capacity

Megawatts (Thousands)

Europe
North America
Asia

Year

More than 1/2 From Feed-in Tariffs

Paul Gipe, wind-works.org
2009 World Wind Capacity

38,000 MW

77,000 MW

42,000 MW

Paul Gipe, wind-works.org
Wind Growing Rapidly 2005-2010

- Germany: ~2,000 MW/yr  
  30,000 MW by 2012
- Spain: ~2,000 MW/yr
- USA: ~6,000 MW/yr
- China: ~5,000 MW/yr
- India: ~1,500 MW/yr
- ~1% of World Supply

Paul Gipe, wind-works.org
Solar PV Growing Rapidly

- 20,000 MW Worldwide
- 6,000+ MW/yr
- $20+ Billion
- Major Markets
  - Germany--3,000 MW/yr (2009)
  - Spain--500+ MW/yr (2,600 MW in 2008)
  - Japan--250 MW/yr
  - USA--300 MW/yr
  - California--200 MW/yr

Paul Gipe, wind-works.org
Rancho Seco, California
World Solar PV Capacity 2009
~20,000 MW

- Germany: 46%
- Spain: 21%
- Japan: 15%
- USA: 9%
- Rest of World: 8%

More than 2/3 from Feed-in Tariffs

Paul Gipe, wind-works.org
Höhe Westerwald, Germany

Setting the Stage

Paul Gipe; wind-works.org
North Americans Have Been Dabbling Around the Edges of Renewable Energy Policy

Little Recognition of the Crisis Facing the Continent

Paul Gipe, wind-works.org
Profound Issues Confront North America’s Energy Future

• Climate Change Not Only Issue
• Transportation (Liquid) Fuels
  Very Little Public Transit
• Domestic Supplies Declining

Paul Gipe, wind-works.org
Cowley Ridge, Alberta
Profound Issues Confront North America’s Energy Future

- Natural Gas Production May Have Peaked Critical for Heating

Paul Gipe, wind-works.org
Goderich, Ontario
North American RE Market Growth

• Exciting, Yes
• Significant, Yes
• Not Nearly Enough by Any Standard
North America Needs Massive Reconstruction of its Infrastructure

Renewable Energy Development Can Reindustrialize the North American Economy

Paul Gipe, wind-works.org

Noordoostpolder, the Netherlands
And Can Create a Rural Revolution Through “Electricity Rebels”
Renewable Tariffs
The Philosophical Context

Paul Gipe, wind-works.org
Geothermal: Colline Metallifere, Italy
Do We Want Renewables?

Paul Gipe, wind-works.org
If Yes, Then What Works Best?

- Who Gets Contracts
  Elite Few or All Who Want Them?
- How To Pay For Them
  RECs/ROCs/Green Tags
  Subsidies (PTC, WPPI)
  Advanced Renewable Tariffs

Paul Gipe, wind-works.org
Dunkerque, France
Market Mechanism Status

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

- **Renewable Tariffs**
  - Once Only Non-Anglophone Countries
  - Now Ontario, Great Britain
  - Aggressive Targets

Paul Gipe, wind-works.org

Haverigg, Cumbria, Britain
What are Our Goals?

- Primary
  High Penetration of Renewables Quickly

- Secondary
  Equitably Distributed Ownership
  Rural Development
  Distributed Generation
  New Industry & Jobs
## Wind Energy

### A Job Creation Engine in Europe

<table>
<thead>
<tr>
<th>Europe</th>
<th>Direct</th>
<th>Indirect</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td>38,000</td>
<td>52,000</td>
<td>90,000</td>
</tr>
<tr>
<td>Denmark</td>
<td>20,500</td>
<td>17,230</td>
<td>37,730</td>
</tr>
<tr>
<td>Spain</td>
<td>23,500</td>
<td>?</td>
<td>23,500</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>150,000</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2008, BWE, EWEA

Paul Gipe, wind-works.org

Enercon, Aurich, Germany
Myths to Dispel

• Renewables are Free or Cheap
  But They Are Affordable & Worth It
• Renewables Can’t Be Added Quickly
  or Can’t Make a Difference
• Net Metering Makes a Difference
• Feed-in Tariffs Not Market-Based
• Feed-in Tariffs are Costly
# Adding Renewables Quickly

**Germany Renewables: 10 Years--5% to 15% of Supply**

<table>
<thead>
<tr>
<th></th>
<th>Wind 5 yrs</th>
<th>Wind 10 yrs</th>
<th>Solar 5 yrs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td>15 TWh/yr</td>
<td>35 TWh/yr</td>
<td>5 TWh/yr</td>
</tr>
<tr>
<td>Spain</td>
<td>15 TWh/yr</td>
<td>28 TWh/yr</td>
<td>5 TWh/yr</td>
</tr>
</tbody>
</table>

FL: 225 TWh/yr

--

Paul Gipe, wind-works.org
## High Penetration is Possible

<table>
<thead>
<tr>
<th></th>
<th>Percent Wind</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>1.2%</td>
</tr>
<tr>
<td>California</td>
<td>1.5%</td>
</tr>
<tr>
<td>Germany</td>
<td>7%</td>
</tr>
<tr>
<td>Spain</td>
<td>12%</td>
</tr>
<tr>
<td>Denmark</td>
<td>21%</td>
</tr>
</tbody>
</table>

2007, EWEA; Excepting California by Paul Gipe; IEA California: 2.3%.

Paul Gipe, wind-works.org
Net Metering

- Little Net Benefit Overall (in MW)
- "Feel Good" for Participants
- With Renewable Tariffs, Who Needs It
- Europeans: Net Metering?
  Was ist das?
  Qu'est-ce que c'est?

Paul Gipe, wind-works.org
Net Metering TWh Contribution

- Solar PV: ~10% Worldwide
- Wind: ~0% Worldwide
- Wind & Solar: ~0.01% Worldwide!
- Conclusion: Insignificant

Cowley Ridge, Alberta

Paul Gipe, wind-works.org
Feed-in Tariffs Deliver Results

• >50% of Wind Worldwide
• >90% of Solar PV Worldwide
• >90% of Farm Biogas Worldwide

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

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

- ~3,000 MW in 2009!
- Total 8,000 MW
  - ~8 TWh/yr of Generation
- ~2% Supply in Bavaria
- ~1% Supply in Germany

Paul Gipe, wind-works.org
German Homeowners--New Revenue

- ~100 MW on Home Rooftops 2009
- ~4,000 MW+ Total
- ~4 TWh/yr
- ~€2 Billion/yr Revenue
- Anyone with a Roof Can Do Solar in Germany!

Paul Gipe, wind-works.org
German Farms--Solar PV Crop

- ~1,000 MW on Barn Rooftops in 2009
- ~3,000 MW Total in 2009 (€15 Billion)
- ~3 TWh/yr (€1.5/yr Billion)
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
German Renewables
More than Electricity

• Hot Water
• Space Heating
• the Hotel Victoria Has it All . . . from Solar Energy
German Renewable Generation

TWh Generated per Year

- ARTs (EEG)
- Feed Law (StrEG)

Year

Advanced Renewable Tariffs Launched
Feed-in Tariff (StrEG)

Paul Gipe, wind-works.org
German Renewables 2008
~93 TWh (15%)

Wind 40.4
Biomass 27.1
Hydro 21.8
Solar PV 4

6.6%
4.3%
3.5%
~1%

Source: BMU
Florida: 225 TWh/yr
Paul Gipe, wind-works.org
Germany’s Renewable Tariffs
The Results (2008)

- Renewables 15.3% of Supply
- Renewables 9.6% of Primary Energy
- 90,000 Employed in Wind Industry
- 50,000 Employed in PV Industry
- 8,000 Employed in Biogas Industry
- 280,000 Employed in Renewables
- €32 (~$50) Billion Turnover
Cost of German EEG (2007) 
~$50/yr/household

- Generation 58%
- EEG 5%
- Eco Tax 11%
- VAT 14%
- Concession 10%
- CHP Act 2%
- Paul Gipe, wind-works.org
## Political Price-Political Quantity

### Market Mechanisms

<table>
<thead>
<tr>
<th>Feed Law</th>
<th>Political</th>
<th>Market</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quota/RPS/Tendering</td>
<td>Market</td>
<td>Political</td>
</tr>
</tbody>
</table>

Both are Market Mechanisms

Paul Gipe, wind-works.org
<table>
<thead>
<tr>
<th></th>
<th>USD/kWh</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quotas &amp; TGC</td>
<td>0.13-0.17</td>
</tr>
<tr>
<td>Feed-in Tariffs</td>
<td>0.09-0.011</td>
</tr>
</tbody>
</table>

FITs: $0.04-$0.06/kWh less costly.

Paul Gipe, wind-works.org
Ernst & Young
Germany and Britain
Cost of Renewables (2006)

• Germany: 4x more energy generated
• Germany: @ 1/5 less relative cost of GB Renewable Obligation Certificates
<table>
<thead>
<tr>
<th></th>
<th>France</th>
<th>UK</th>
</tr>
</thead>
<tbody>
<tr>
<td>TWh 2006</td>
<td>10.5</td>
<td>12.9</td>
</tr>
<tr>
<td>Overcost (Million Euros)</td>
<td>124</td>
<td>611</td>
</tr>
<tr>
<td>CO2 Mitigation (Euros/t)</td>
<td>39.5</td>
<td>86</td>
</tr>
<tr>
<td>Overcost (Euros/kWh)</td>
<td>0.012</td>
<td>0.047</td>
</tr>
<tr>
<td>Relative Cost</td>
<td>0.25</td>
<td></td>
</tr>
</tbody>
</table>

Cécile Bordier, Caisse des Dépôts, Dec. 2008
EU Policy Mechanisms

Figure 4:
Price ranges (average to maximum support) for direct support of wind onshore in EU-15 Member States (average tariffs are indicative) compared to the long-term marginal generation costs (minimum to average costs). Support schemes are normalised to 15 years.

Over Cost of French ARTs Declining

Figure 9 – Amount of energy from renewable sources and costs linked to the feed-in tariffs

Source: Energy Regulation Commission, 2008, author’s calculations.

Cécile Bordier, Caisse des Dépôts, Dec. 2008

Overcosts, 2008: ~0 due to increase in electricity costs. Bernard Chabot, Nov. 2008.
Why the European Success?

#1 Community Involvement
Germany & Denmark

#2 Advanced Renewable Tariffs
18 EU Countries use Electricity Feed Laws

Paul Gipe, wind-works.org
Stromrebellen (Electricity Rebels) Community Power

- Democratizing Electricity Generation
- Creating Local Investment
- Creating Local Jobs
- Creating Opportunity--and Hope
- Denmark, Germany, and France, Minnesota, Ontario and . . . Florida?

Paul Gipe, wind-works.org
What is Community Power?

- **Local**
  Responsible to the Community

- **Locally Owned**
  Cooperatives, First Nations, Farmers, Homeowners

Paul Gipe, wind-works.org

Fuchskaute, Germany
Why Community Power

• Participation ~ Greater Acceptance
• Distributed ~ Greater Resiliency
• Clean & Green (Mostly)
• Human Scale
• Local Ownership Creates

New Cash Crop For Farmers, Homeowners, & First Nations
Lynetten Co-op København

- 7 x 600 kW
- 4 Owned by Co-op
- 3 Owned by Municipal Utility

Paul Gipe, wind-works.org
Middelgrunden Co-op København

- 20 x 2 MW Off-shore
- 1/2 Owned by Co-op
- 1/2 Owned by Utility
- 8,500 Investors
- €570 per Share
- Visible from Christiansborg Palace
Community Power is About People and Opportunity

Paul Gipe, wind-works.org
Anton Bro
Thyborøn-Harboøre Vindmøllelaug

• Near Offshore
• Share Cooperative
• 4 x 2 MW
• 35 Million kWh/yr
• All Information Public on the Web

Paul Gipe, wind-works.org
Josef Pesch, Fesa

- 45 MW
- 60 million kWh/yr
- Just One of Many

Paul Gipe, wind-works.org
Ursula Sladek, EWS
(Elektritzitätswerke Schönau)

- 31,000 Customers
- Hydro, Solar, & Wind
Heinrich Bartelt, Dardesheim

- 62 MW Wind
- 380 kW Solar PV
- 5% Royalties
  - 1% for Nearby Villages
  - 2% for Landowners with Turbines
  - 2% for Landowners without Turbines
François Pélissier, Erélia

- Le Haut des Ailes, Lorraine
- 32 MW

Objectives
- New Jobs Locally
- New Opportunity Locally
Jim Young
One Tough Hombre
Medicine Bow, WY

- Rebuilt 65 kW
- Developed Project

Paul Gipe, wind-works.org
Phil Littler
Shafer Systems
Iowa

- 500,000 kWh/yr
- Local Landmark
- One Person Can Make a Difference

Paul Gipe, wind-works.org
Local People Helping Local People
Hans-Heinrich Andresen

- Manages 16 Wind Farms
- in 16 Villages
- All Locally Owned
  - 15 Owners in Smallest
  - 400 Owners in Largest
- Now Planning Their Own Transmission Line

Paul Gipe, wind-works.org
Local Entrepreneurs Building Local Projects

• 2.6 MW Locally Owned Solar Plant
• Locally Developed, Locally Built, Locally Owned

Nico Petersen, Solar Park Rodenäs

Paul Gipe, wind-works.org
The Farmers of Friedrich-Wilhelm-Lübke-Koog

- 1990 First Locally-Owned Wind Farm
- First Repowering (w/ Bigger Turbines)
- 2009 Added 30-50 kW Solar PV

Friedrich-Whilhelm-Lübke-Koog, Germany
Never Underestimate the Ingenuity of Farmers

- When the Barn Doesn’t Face South—No Problem
- Build a Rack That Will!

Paul Gipe, wind-works.org
Friedrich-Whilhelm-Lübke-Koog, Germany
Community Power is also about Faith in Yourself and in Your Community
Yes, You Can Do This
You Don’t Have to be Danish, German, or French

Paul Gipe, wind-works.org
## Co-Op & Farmer-Owned Wind

<table>
<thead>
<tr>
<th>Country</th>
<th>Farmer</th>
<th>Co-op</th>
<th>Corporate</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Netherlands</td>
<td>60%</td>
<td>5%</td>
<td>35%</td>
</tr>
<tr>
<td>Germany</td>
<td>10%</td>
<td>40%</td>
<td>50%</td>
</tr>
<tr>
<td>Denmark</td>
<td>64%</td>
<td>24%</td>
<td>12%</td>
</tr>
<tr>
<td>Great Britain</td>
<td>1%</td>
<td>1%</td>
<td>98%</td>
</tr>
<tr>
<td>Spain</td>
<td>0%</td>
<td>0%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Source: Dave Toke, University of Birmingham, 2005, 2008

Paul Gipe, wind-works.org
## Minnesota Distributed Wind

<table>
<thead>
<tr>
<th></th>
<th>MW</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small Developer</td>
<td>104</td>
<td>12%</td>
</tr>
<tr>
<td>Farmer Owned</td>
<td>74</td>
<td>8%</td>
</tr>
<tr>
<td>Locally Owned</td>
<td>72</td>
<td>8%</td>
</tr>
<tr>
<td>Municipal Utility</td>
<td>19</td>
<td>2%</td>
</tr>
<tr>
<td>Rural Electric Cooperative</td>
<td>6</td>
<td>1%</td>
</tr>
<tr>
<td>College/University</td>
<td>5</td>
<td>1%</td>
</tr>
<tr>
<td>School</td>
<td>1</td>
<td>0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>281</td>
<td>31%</td>
</tr>
</tbody>
</table>

Source: Windustry.org, March 2007

Paul Gipe, wind-works.org
# Community Wind Economic Impact

<table>
<thead>
<tr>
<th></th>
<th>Community Wind (5%)</th>
<th>Community Wind (8%)</th>
<th>Corporate Wind</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Value Added</strong></td>
<td>$1,300,000</td>
<td>$640,000</td>
<td>$250,000</td>
</tr>
<tr>
<td><strong>Jobs</strong></td>
<td>14.5</td>
<td>8.2</td>
<td>4.3</td>
</tr>
</tbody>
</table>

*From Operations*

Arne Kildegaard  
University of Minnesota, Morris

Paul Gipe, wind-works.org
Potential per Ontario Farm

- 2MW Turbine, 80 m Ø, 80 m Tower
- ~$5 million CAD Installed
- ~4 million kWh/Year (~6.5 m/s)
- ~$500,000 CAD/yr @ $0.145/kWh
- Simple Payback: ~10 Years
- After Payback: ~$500,000 CAD/yr

Skibsted Fjord, Denmark
Paul Gipe, wind-works.org
Solar PV
Ontario Barn Roof

• 30 kW; ~$275,000
• 30,000 kWh/yr
• $21,000/yr
• Simple Payback ~13 years
Aggressive Targets Require Aggressive Measures

German Renewable Energy Targets

<table>
<thead>
<tr>
<th></th>
<th>2010</th>
<th>2020</th>
<th>2030</th>
<th>2050</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity</td>
<td>12.5%</td>
<td>30%</td>
<td>45%</td>
<td>80%</td>
</tr>
</tbody>
</table>

Paul Gipe, wind-works.org
Advanced Renewable Tariffs

• What Are They?
  Payment for Generation (Feed-in Tariffs)
  Political Price, Not Political Quota

• How Do They Work?
  Price Differentiation
  Paying for Solar, Paying for Wind

• Where?
  Germany, France,
  Spain . . .
  . . . 18 EU countries

Paul Gipe, wind-works.org
Renewable Tariff Design

- Simple, Comprehensible, & Transparent
- Priority Access & Purchase
- Lengths Sufficient for Profitability
- Prices Sufficient to Pay for Generation

Fair But Not Undue Profit Through Price Differentiation

Paul Gipe, wind-works.org
Altamont Pass, California
Renewable Tariff Design
Price Differentiation

- For Different Technologies
- For Different Applications
- For Different Sizes
- For Different Resource Intensities
  For Wind (Germany & France)
  For Solar (France)

Paul Gipe, wind-works.org
## Renewable Tariffs Contract Length

<table>
<thead>
<tr>
<th>Country</th>
<th>Wind</th>
<th>Solar</th>
<th>Hydro</th>
<th>Biomass</th>
</tr>
</thead>
<tbody>
<tr>
<td>France</td>
<td>15</td>
<td>20</td>
<td>20</td>
<td>15</td>
</tr>
<tr>
<td>Germany</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Ontario</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Portugal</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Spain (2007)*</td>
<td>&gt;15</td>
<td>&gt;25</td>
<td>&gt;25</td>
<td>&gt;20</td>
</tr>
</tbody>
</table>

Longer Contracts Reduce Initial Price.

Paul Gipe, wind-works.org
## Renewable Tariffs Inflation Adjustment

<table>
<thead>
<tr>
<th>Country</th>
<th>Inflation Adjustment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td>0%</td>
</tr>
<tr>
<td>Ontario RFP</td>
<td>15%</td>
</tr>
<tr>
<td>Ontario SOC</td>
<td>20%</td>
</tr>
<tr>
<td>Prince Edward Island</td>
<td>26%</td>
</tr>
<tr>
<td>France</td>
<td>60%</td>
</tr>
<tr>
<td>Spain</td>
<td>50-75</td>
</tr>
<tr>
<td>Greece</td>
<td>100%</td>
</tr>
<tr>
<td>Ireland</td>
<td>100%</td>
</tr>
</tbody>
</table>

Higher Inflation Adjustment Reduces Initial Price.

Paul Gipe, wind-works.org
## ARTs Feature Comparison

<table>
<thead>
<tr>
<th>Feature</th>
<th>Germany</th>
<th>France</th>
<th>Spain</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARTs</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Cost-Based Tariffs</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Program Limits</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Term</td>
<td>20</td>
<td>15-20</td>
<td>25+</td>
</tr>
<tr>
<td>Inflation</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Solar Tiers</td>
<td>5</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Wind Offshore</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Wind Tiered Tariffs</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Wind Tiers</td>
<td>Continuous</td>
<td>Continuous</td>
<td>n/a</td>
</tr>
<tr>
<td>Community Power</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

Paul Gipe, wind-works.org
Renewable Tariffs . . .
Developing Momentum

Toronto, Ontario

Paul Gipe, wind-works.org
“Nothing is as powerful as an idea whose time has come.”
-- Victor Hugo

*Loose translation of “On résiste à l'invasion des armées; on ne résiste pas à l'invasion des idées.

Paul Gipe, wind-works.org
Renewable Tariffs in North America . . Unthinkable?

- Yes--Just 6 years ago
  “You’re Absolutely Nuts!”
  Andy Karsner, DOE, 2006
- Today? No
- Now Possible
- Growing Trend
  in North America
  & Developing World
  China, India, Mongolia

Paul Gipe, wind-works.org

Gaspé, Quebec
Grassroots Movement

• Explosion of Interest
• Groups Active
  Across US & Canada
• Public Out in Front
  Demands Aggressive Action
• Tipping Point Reached?

San Gorgonio Pass, California
Paul Gipe, wind-works.org
Renewable Tariffs Are In Play

- Nova Scotia to British Columbia
- Washington State to Florida
- Vermont to California
- US House
Ontario Moved First

First Modern System of Advanced Renewable Tariffs in North America

Paul Gipe, wind-works.org

Montfort, Wisconsin
Ontario “Gets It”

• Closing Coal Plants
• Delaying Nuclear Build
• Putting Renewables First

Groundbreaking in North America

Paul Gipe, wind-works.org
Goderich, Ontario
Ontario’s Green Energy & Green Economy Act

- Multi-faceted
- Efficiency & Conservation
- Renewable Energy

Procure Through Feed-in Tariffs

Paul Gipe, wind-works.org
Ontario’s Green Energy Act

The Most Progressive Renewable Energy Policy in North America in Two Three Decades

Paul Gipe, wind-works.org
Ontario’s Green Energy Act

- Changes Public Policy on Electricity
  Includes Industrial & Environmental Policy
- Gives Renewables Priority
  In Utility Procurement & System Design
- Targets Industrial Development
- Targets Job Creation
  Goal: 50,000 Jobs in 3 Years

Paul Gipe, wind-works.org
Ontario’s Feed-in Tariffs

- Differentiated by Size & Technology
- Differentiated by Application
- Tariffs Based on Cost of Generation
  Plus Reasonable Profit
- No Program Cap (Bring It On!)

Sarnia, Ontario

Paul Gipe, wind-works.org
Ontario’s Feed-in Tariffs

• First Offshore Wind Tariffs in NA
• First Aboriginal Bonus in NA
  First NA Policy for First Nations
• First Differentiated Solar PV Tariffs
  5 Tranches or Classes
• Best Wind, Solar, & Biogas Tariffs in NA
  Competitive Internationally

Paul Gipe, wind-works.org
Prices Paid for Offshore Wind Energy

- Germany
- France
- Ontario

$\text{CAD/kWh}$

Paul Gipe, wind-works.org

Middelgrunden, Denmark

Google Maps
Ontario’s Feed-in Tariffs

• No Subsidies or Grants
• Costs Borne by Consumers
  Not Taxpayers--More Egalitarian
• Community Wind Bonus
  Third Jurisdiction in North America

Paul Gipe, wind-works.org
## Grading North American FITs
### The Gold Standard

<table>
<thead>
<tr>
<th></th>
<th>Score</th>
<th>Grade</th>
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<tbody>
<tr>
<td>Germany</td>
<td>90</td>
<td>A</td>
</tr>
<tr>
<td>France</td>
<td>90</td>
<td>A</td>
</tr>
<tr>
<td>Spain (Fixed Tariff)</td>
<td>80</td>
<td>A-</td>
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</tbody>
</table>

Paul Gipe, wind-works.org

Fuchskaute, Germany
## Grading North American FITs

### Historical FITs

<table>
<thead>
<tr>
<th></th>
<th>Score</th>
<th>Grade</th>
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<tbody>
<tr>
<td>Ontario SOC (2006-2008)</td>
<td>55</td>
<td>D</td>
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*Ontario SOC--Good First Start for North America*

Paul Gipe, wind-works.org
# Grading North American FITs

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Germany</th>
<th>France</th>
<th>Ontario</th>
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<tbody>
<tr>
<td>Program Caps</td>
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<td>10</td>
<td>10</td>
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<tr>
<td>Project Size Caps</td>
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<td>8</td>
<td>8</td>
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<td>Contract Term</td>
<td>10</td>
<td>10</td>
<td>10</td>
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<tr>
<td>Technologies Included</td>
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<td>10</td>
<td>8</td>
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<tr>
<td>Tariffs Based on Cost of Generation</td>
<td>10</td>
<td>10</td>
<td>10</td>
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</tbody>
</table>

Paul Gipe, wind-works.org
## Grading North American FITs

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Germany</th>
<th>France</th>
<th>Ontario</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tariffs Differentiated by Technology</td>
<td>10</td>
<td>10</td>
<td>10</td>
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<tr>
<td>Tariffs Differentiated within Technology</td>
<td>20</td>
<td>16</td>
<td>20</td>
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<tr>
<td>Wind Tariffs Differentiated by Resource</td>
<td>10</td>
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<td>Inflation Indexing</td>
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<td>6</td>
<td>3</td>
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<tr>
<td>Bonus Payments or Adders</td>
<td>0</td>
<td>0</td>
<td>5</td>
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</table>

Paul Gipe, wind-works.org
## Grading North American FITs

**Existing FITs**

<table>
<thead>
<tr>
<th>State/Site</th>
<th>Score</th>
<th>Grade</th>
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</thead>
<tbody>
<tr>
<td>Ontario (2009)</td>
<td>84</td>
<td>A-</td>
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<tr>
<td>Vermont</td>
<td>54</td>
<td>D</td>
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<tr>
<td>Maine</td>
<td>43</td>
<td>F</td>
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<tr>
<td>Wisconsin IOUs</td>
<td>36</td>
<td>F</td>
</tr>
<tr>
<td>California</td>
<td>28</td>
<td>F</td>
</tr>
<tr>
<td>Oregon</td>
<td>16</td>
<td>F</td>
</tr>
</tbody>
</table>

Paul Gipe, wind-works.org
Ontario Success Due To

• Push for Renewable Policy
  Not a Solar PV or a Wind Policy

• Push for Conservation & Efficiency
  Reduces Program Costs to Ratepayers
  (Danes Pay Less for Electricity Than Ontarians)

• Collaborative Strategy
  Green Energy Act Alliance: Green NGOs, Ag, & Labor
  Trade Groups: CanSIA, CanWEA, OWA

• Public Consultation

Paul Gipe, wind-works.org
Feed-in Tariffs

“Turn farms, homes, and businesses into entrepreneurs”

--Terry Tamminen, Former Chief Policy Advisor to Governor Arnold Schwarzenegger
Move From
A Culture of Consumption
to
A Culture of Conservation

--Ontario Premier Dalton McGuinty

Paul Gipe, wind-works.org

Montfort, Wisconsin
Move From
A Nation of Consumers
to
A Nation of Producers

Paul Gipe, wind-works.org
Lackawanna, New York
No Time for Half-Measures

No Time to Lose

Paul Gipe, wind-works.org
We Need A Lot More Wind . . .

Matane, Quebec

Paul Gipe, wind-works.org
A Lot More Solar

Paul Gipe, wind-works.org

Hinesburg, Vermont
A Lot More Renewable Energy Technology for Life*

*from N.F.S. Grundtvig, Danish Theologian

Paul Gipe, wind-works.org
Renewables . . .

When You Look Closely . . .

. . . Worth Every Cent

Paul Gipe, wind-works.org
Renewable Tariffs--New Policy Option for Farmers, Homeowners, & Small Businesses

www.wind-works.org

Manawatu Gorge, New Zealand