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, An Environmental Trust, APROMA, ASES, AusWEA, AWEA, David Blittersdorf, Jan & David Blittersdorf Foundation, BWEA, BWE, CanWEA, Canadian Co-operative Assoc., CAW, CEERT, Deutsche Bank, 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, WAWWG, WE Energies, the Folkecenter, the Izaak Walton League, the Minnesota Project, the Sierra Club, World Future Council, and Zond Systems, and written for magazines in the USA, Canada, France, Denmark, and Germany.
Advanced Renewable Tariffs
an Energy Revolution
for a Sustainable Colorado
by
Paul Gipe
Renewable Energy Has Come of Age

Noordoost polder, the Netherlands

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

Megawatts (Thousands)

Year

Europe
North America
Asia

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
2009 Solar PV Capacity

• 20,000 MW Worldwide
• 7,000+ MW/yr
• $20+ Billion
• Major Markets
  - Germany--3,800 MW*
  - Italy--700 MW/yr*
  - Japan--500 MW
  - USA--450 MW/yr
  - California--200 MW/yr
  - Colorado--25 MW/yr

*Feed-in Tariff Market

Paul Gipe, wind-works.org

Rancho Seco, California
World Solar PV Capacity 2009
~20,000 MW

Germany 44%
Spain 16%
Japan 13%
USA 8%
Italy 5%
Czech 2%
Rest of World 11%

More than 3/4 from Feed-in Tariffs

Paul Gipe, wind-works.org
Setting the Stage

. . . The Scale of the Problem

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 Only One Issue
- Transportation (Liquid) Fuels
  Very Little Public Transit
- Domestic Supplies Declining

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

• Exciting, Yes
• Significant, Yes
• Not Nearly Enough by Any Standard

Paul Gipe, wind-works.org

Buffalo Ridge, Minnesota
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 Create a Rural Revolution Through “Electricity Rebels”*

*Who own their own generation.

Paul Gipe, wind-works.org
Friedrich-Whilhelm-Lübke-Koog, Germany
Renewable Tariffs
The Philosophical Context

Paul Gipe, wind-works.org
Geothermal: Colline Metallifere, Italy
What are Our Goals?

• **Primary**
  
  High Penetration of Renewables Quickly

• **Secondary**

  Equitably Distributed Ownership
  
  Rural Development
  
  Distributed Generation
  
  New Industry & Jobs

Paul Gipe, wind-works.org

Wieringemeerpolder, the Netherlands
Do We Really Want Renewables?

San Gorgonio Pass, California

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
  REC\textsuperscript{s}/ROC\textsuperscript{s}/Green Tags
  Subsidies (PTC, ITC)
  Advanced Renewable Tariffs
  --Differentiated Feed-in Tariffs
Feed-in Tariffs Deliver Results

• >50% of Wind Worldwide
• >75% of Solar PV Worldwide
• >90% of Farm Biogas Worldwide

Ydby, Denmark
Paul Gipe, wind-works.org
Myths to Dispel

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

<table>
<thead>
<tr>
<th>Country</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>

Germany Renewables: 10 Years--5% to 15%
Spain: 10 Years--0% to 10%
Colorado: ~61 TWh/yr

Paul Gipe, wind-works.org
## High Penetration Quickly 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>1.5-2.3</td>
</tr>
<tr>
<td>Germany</td>
<td>6.5%</td>
</tr>
<tr>
<td>Spain</td>
<td>14.3%</td>
</tr>
<tr>
<td>Portugal</td>
<td>15.3%</td>
</tr>
<tr>
<td>Denmark</td>
<td>21%</td>
</tr>
</tbody>
</table>

2009: Multiple Sources  
Paul Gipe, wind-works.org
### Political Price-Political Quantity

#### Market Mechanisms

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

Both are Market Mechanisms

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
Over Cost of French Renewable Tariffs

Source: www.cre.fr
Paul Gipe, wind-works.org

Year

TWh

Million Euros

Wind
Small Hydro
Waste
Other

Million Euros

2003 2004 2005 2006 2007 2008 2009

0 5 10 15 20 25 30 35

0 50 100 150 200 250 300 350

Source: www.cre.fr
Paul Gipe, wind-works.org
Aggressive Targets Require Aggressive Measures

German Renewable Energy Targets

<table>
<thead>
<tr>
<th>Electricity</th>
<th>2010</th>
<th>2020</th>
<th>2030</th>
<th>2050</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>12.5%</td>
<td>39%</td>
<td>50%</td>
<td>80%</td>
</tr>
</tbody>
</table>

Paul Gipe, wind-works.org
Why the European Success?

- #1 Community Involvement
  Germany & Denmark
- #2 Advanced Renewable Tariffs
  Many EU Countries use Electricity Feed Laws

Paul Gipe, wind-works.org
Stauning, Denmark
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

Altamont Pass, California

Paul Gipe, wind-works.org
Renewable Tariff Design
Price Regulation

- Most Efficient
- Least Costly
- Simpler
- Is Compatible with Market Economies

From Bernard Chabot, ADEME

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

• For Different Technologies
• For Different Applications
• For Different Sizes
• For Different Resource Intensities
  For Wind (Germany, France, & China!)
  For Solar (France, Oregon)

Paul Gipe, wind-works.org
## Renewable Energy Tariffs Program Limits

<table>
<thead>
<tr>
<th>Country</th>
<th>Wind</th>
<th>Solar</th>
<th>Hydro</th>
<th>Biomass</th>
</tr>
</thead>
<tbody>
<tr>
<td>Austria</td>
<td></td>
<td>15 MW</td>
<td></td>
<td></td>
</tr>
<tr>
<td>California*</td>
<td></td>
<td>3,000 MW</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Denmark</td>
<td>20%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>France</td>
<td>17,000 MW</td>
<td>500 MW</td>
<td>2,000 MW</td>
<td>2,000 MW</td>
</tr>
<tr>
<td>Germany</td>
<td>No Limit</td>
<td>No Limit</td>
<td>No Limit</td>
<td>No Limit</td>
</tr>
<tr>
<td>Italy</td>
<td></td>
<td>500 MW</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ontario</td>
<td>No Limit</td>
<td>No Limit</td>
<td>No Limit</td>
<td>No Limit</td>
</tr>
<tr>
<td>South Korea</td>
<td></td>
<td>1,300 MW</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spain</td>
<td>20,000 MW</td>
<td>400 MW</td>
<td>2,400 MW</td>
<td>3,200 MW</td>
</tr>
</tbody>
</table>

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
Differentiated Tariffs for Wind

• Distributed Benefits
  Only Accrue From Distributed Generation
  Differentiated Tariffs = Distributed Wind

• Reduces Pressure on Windiest Sites
  Profitability Still Higher at Windy Sites

• Reduces NIMBYism
  By Enabling Greater Participation

Paul Gipe, wind-works.org
French Wind Tariffs

Resource Productivity Method

• Fair Profits at Medium Wind Sites
• Not “Undue” Profits at Windy Sites
• Profitability Index Method (Chabot)

Not Discounted Cash Flow Model

Paul Gipe, wind-works.org
French Wind Tariffs by Specific Yield

Specific Yield (kWh/m²/yr)

0 0.05 0.1 0.15

$CAD/kWh

Base Medium High

960 1000 1040 1080 1120 1160 1200 1240 1280 1320 1360 1400 1440

Specific Yield (kWh/m²/yr)

Paul Gipe, wind-works.org

Chateau de Lastours, France
## 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 & Solar Photovoltaics in Germany

Year

MW Total (Thousands)

1,000-Rooftops

100,000 Rooftops

Advanced Renewable Tariffs Launched

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

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

- ~3,800 MW in 2009!
- Total 9,000 MW
  ~9 TWh/yr of Generation
- New Target: 3,000 MW/yr!
- ~2%Supply in Bavaria
- ~1+%Supply in Germany

USA: Total of 1,250 MW in 2009.
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)
Schönau, Germany

German Churches . . .

. . . Protecting Creation

Paul Gipe, wind-works.org
Germany’s Renewable Tariffs
The Results (2009)

- 16% of Electricity
- 10% of Primary Energy
- Jobs
  - Wind: 90,000
  - Solar PV: 50,000
  - Biogas: 8,000
  - Total: 300,000

Paul Gipe, wind-works.org
Höhe Westerwald, Germany
Cost of German EEG (2008) ~$50/yr/household

BMU: EEG Costs <5%, ~€0.01/kWh, 2008.
Paul Gipe, wind-works.org
European Projected Development 2010 with Feed-in Tariffs

<table>
<thead>
<tr>
<th></th>
<th>Wind</th>
<th>Solar PV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td>2,500</td>
<td>6,000</td>
</tr>
<tr>
<td>Spain</td>
<td>2,500</td>
<td>50-100</td>
</tr>
<tr>
<td>France</td>
<td>1,000</td>
<td>200</td>
</tr>
<tr>
<td>Italy</td>
<td>Quota</td>
<td>1,500</td>
</tr>
</tbody>
</table>

Paul Gipe, wind-works.org
## European 2010 Feed-in Tariffs

<table>
<thead>
<tr>
<th>Country</th>
<th>Wind</th>
<th>Solar PV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td>Stable</td>
<td>2010 Cuts in Two Steps: New 3,000 MW Target</td>
</tr>
<tr>
<td>Spain</td>
<td>Possible Cuts</td>
<td>Further Cuts</td>
</tr>
<tr>
<td>France</td>
<td>Stable</td>
<td>Raised Tariffs: New Resource Differentiated Tariffs</td>
</tr>
<tr>
<td>Italy</td>
<td>Quota</td>
<td>2011 Cuts: New Target; 3,000 MW 2011-13</td>
</tr>
</tbody>
</table>

Paul Gipe, wind-works.org
## FIT Programs in Development

<table>
<thead>
<tr>
<th>Country</th>
<th>Resource Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finland</td>
<td>Wind &amp; Biomass</td>
</tr>
<tr>
<td>Great Britain</td>
<td>Renewable Heat</td>
</tr>
<tr>
<td>Malaysia</td>
<td>All Resources</td>
</tr>
<tr>
<td>Philippines</td>
<td>All Resources</td>
</tr>
<tr>
<td>Japan</td>
<td>All Resources</td>
</tr>
<tr>
<td>Nova Scotia</td>
<td>ComFIT, no Solar PV</td>
</tr>
</tbody>
</table>

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

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

Paul Gipe, wind-works.org

Friedrich-Wilhelm-Lübke-Koog, Germany
Josef Pesch, Fesa

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

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

- 31,000 Customers
- Hydro, Solar, & Wind
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
Never Underestimate the Ingenuity of Farmers

• When the Barn Doesn’t Face South
• Build a Rack That Will!
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
Challenges in North America

• Piecemeal Policy Approach
  Too Slow
  RPS for Wind, Subsidies for Solar

• “Cheap Energy Contract”
  Cheap Today--Expensive Tomorrow

Paul Gipe, wind-works.org
Challenges in North America

• Low Program Caps
  California: 20%?
  LABC-Los Angeles: 3%
  Oregon: 25 MW! (Why Bother?)

• Solar Only or Wind Only

• Timidity & Lack of Vision
  Do We Want Renewables or Don’t We?

Paul Gipe, wind-works.org

Friedrich-Whilhelm-Lübke-Koog, Germany
Renewable Tariffs . . .
Developing Momentum

Toronto, Ontario

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

• Yes--Just 4 years ago
  “You’re Absolutely Nuts!”
  Andy Karsner, DOE, 2006
• Today? No
• Now Possible
• Growing Trend
  in North America
  & Developing World
  China, 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 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 & Job Creation
  50,000 Jobs in Three Years

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
  6 Tranches or Classes
• Most Differentiated Biogas Tariffs
  5 Tranches or Classes
• Best Wind, Solar, & Biogas Tariffs in NA
  Competitive Internationally

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

• No Subsidies or Grants
• Costs Borne by Ratepayers
  Not Taxpayers—More Egalitarian
• Community Wind Bonus
  Individual Farmers Qualify
  $0.01 CAD/kWh Bonus
  $0.145 CAD/kWh (€0.10/kWh)

Paul Gipe, wind-works.org
Ontario Program Status

- **19,000 MicroFIT Applications**
  - ~190 MW Potential
  - 6,000 Contracts Offered (~60 MW)
  - 800 Systems on Line in 1 year

- **8,000 MW of FIT Applications**
  - Requires Substantial Deposit

- **$9 Billion in Likely Private Investment**
Ontario Program Status

• 2,500 MW Awarded Contracts
  1,500 MW to Come with Line Completion
• 460 MW Community & Aboriginal
  ~20% of Total
Ontario Program Status

- 650 MW Solar PV
  with 500 MW of SOC PV ~1,000 MW Contracted
- 1,200 MW Onshore Wind
- 300 MW Offshore Wind

Paul Gipe, wind-works.org

Kingston, Ontario
North American Solar PV Market
Ontario Moves into Top Three

<table>
<thead>
<tr>
<th>Rank</th>
<th>State</th>
<th>MW 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>California</td>
<td>212</td>
</tr>
<tr>
<td>2</td>
<td>New Jersey</td>
<td>57</td>
</tr>
<tr>
<td>3</td>
<td>Ontario</td>
<td>46</td>
</tr>
<tr>
<td>4</td>
<td>Florida</td>
<td>36</td>
</tr>
<tr>
<td>5</td>
<td>Colorado</td>
<td>23</td>
</tr>
</tbody>
</table>

Ontario 2010: ~100-200 MW
Clear Sky Partners: ~800 MW/yr
Paul Gipe, wind-works.org
## North American Solar PV Market

**Ontario to Move into Top Three**

<table>
<thead>
<tr>
<th>Rank</th>
<th>Total Installed MW 2009</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>768</td>
<td>California</td>
</tr>
<tr>
<td>2</td>
<td>128</td>
<td>New Jersey</td>
</tr>
<tr>
<td>3</td>
<td>59</td>
<td>Colorado</td>
</tr>
<tr>
<td>4</td>
<td>48</td>
<td>Ontario</td>
</tr>
<tr>
<td>5</td>
<td>46</td>
<td>Arizona</td>
</tr>
</tbody>
</table>

Clear Sky Partners: ~700 MW in 2011; ~3,000 MW by 2015!

Paul Gipe, wind-works.org
Solar PV Yields

Source: RetScreen
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
Grading North American FITs
10 Criteria

- Program Caps
- Project Size Caps
- Contract Term
- Technologies Included
- Tariffs Based on Cost of Generation
- Tariffs Differentiated by Technology
- Tariffs Differentiated within Technology
- Wind Tariffs Differentiated by Resource
- Inflation Indexing
- Bonus Payments or Adders

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

## The Gold Standard

<table>
<thead>
<tr>
<th></th>
<th>Score</th>
<th>Grade</th>
</tr>
</thead>
<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>
</tr>
</tbody>
</table>

Paul Gipe, wind-works.org

Fuchskaute, Germany
## Grading North American FITs

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Germany</th>
<th>France</th>
<th>Ontario</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program Caps</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Project Size Caps</td>
<td>10</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Contract Term</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Multiple Technologies</td>
<td>10</td>
<td>10</td>
<td>8</td>
</tr>
<tr>
<td>Cost-Based Tariffs</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Technology Differentiation</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Technology Banding</td>
<td>20</td>
<td>16</td>
<td>20</td>
</tr>
<tr>
<td>Resource Differentiation</td>
<td>10</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>Inflation Indexing</td>
<td>0</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>Bonus or Adders</td>
<td>0</td>
<td>0</td>
<td>5</td>
</tr>
</tbody>
</table>

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

### Existing FITs

<table>
<thead>
<tr>
<th>State</th>
<th>Score</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ontario (2009)</td>
<td>84</td>
<td>A-</td>
</tr>
<tr>
<td>Vermont</td>
<td>54</td>
<td>D</td>
</tr>
<tr>
<td>Maine</td>
<td>43</td>
<td>F</td>
</tr>
<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
<table>
<thead>
<tr>
<th></th>
<th>Score</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Michigan</td>
<td>82</td>
<td>A-</td>
</tr>
<tr>
<td>Indiana HB1190</td>
<td>82</td>
<td>A-</td>
</tr>
<tr>
<td>California AB 1106</td>
<td>54</td>
<td>D</td>
</tr>
</tbody>
</table>
# Making the Grade: What’s Needed

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Best Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program Caps</td>
<td>None or &gt;20%</td>
</tr>
<tr>
<td>Project Size Caps</td>
<td>None or 20 MW</td>
</tr>
<tr>
<td>Contract Term</td>
<td>&gt;20 years</td>
</tr>
<tr>
<td>Multiple Technologies</td>
<td>Wind, Solar PV, Solar DHW, Geothermal, CSP</td>
</tr>
<tr>
<td>Cost-Based Tariffs</td>
<td>For All Classes</td>
</tr>
<tr>
<td>Technology Differentiation</td>
<td>Tariffs for Each Class</td>
</tr>
<tr>
<td>Technology Banding</td>
<td>By Application &amp; Size</td>
</tr>
<tr>
<td>Resource Differentiation</td>
<td>Wind &amp; Solar PV</td>
</tr>
</tbody>
</table>

Paul Gipe, wind-works.org

Middelgrunden, Denmark
Making the Grade: What ‘s Needed

• Open to All for All
  Homeowners, Farmers, Business & Industry, Communities, Native Americans
  Regardless of Tax Status
  Tariffs with & without Tax Credits
“Nothing is as powerful as an idea whose time has come.”

-- Victor Hugo*
Time for North Americans to Take the Road to the Future

Freiburg, Germany

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

Paul Gipe, wind-works.org

Goderich, Ontario
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 . . .
A Lot More Solar

Hinesburg, Vermont

Paul Gipe, wind-works.org
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 Energy

The Revolution Has Begun!

www.wind-works.org

Manawatu Gorge, New Zealand