

St. Olaf College V82, Northfield, Minnesota

Advanced Renewable Tariffs Ontario's Status Grading North American Efforts Alberta Department of Energy by Paul Gipe

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

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)

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Ontario Moved First

First Modern System of Advanced Renewable Tariffs in North America



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Montfort, Wisconsin

Ontario “Gets It”

- Closing Coal Plants
 - Delaying Nuclear Build
 - Putting Renewables First
- Groundbreaking in North America



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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

Goderich, Ontario

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

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



Ontario's Feed-in Tariffs

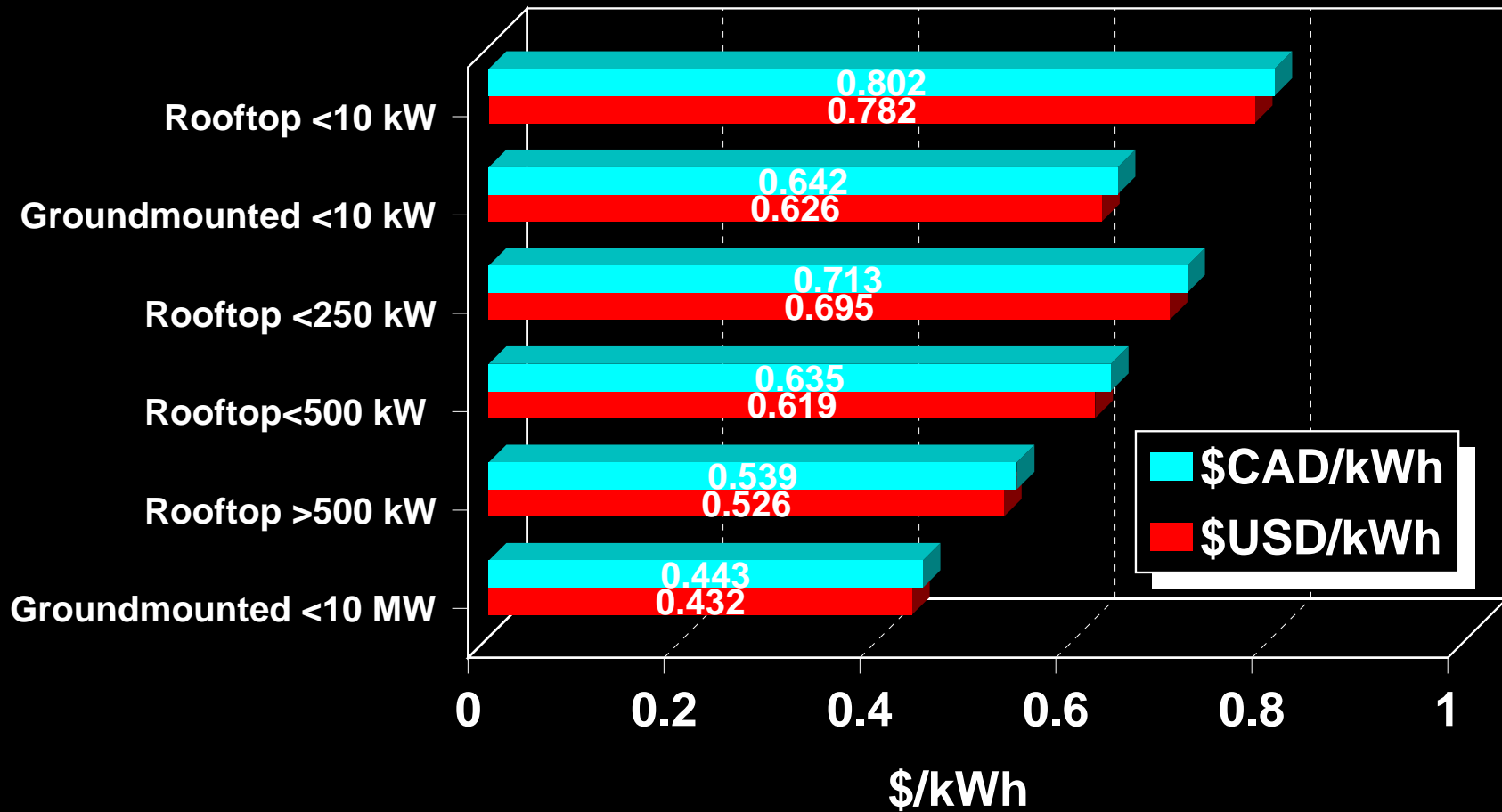
- **First Offshore Wind Tariffs in NA**
- **First Aboriginal Bonus in NA**
First NA Policy for First Nations
- **First Differentiated Solar PV Tariffs**
6 Tranches or Classes
- **Most Differentiated Biogas Tariffs**
5 Tranches or Classes
- **Best Wind, Solar, & Biogas Tariffs in NA**
Competitive Internationally

Ontario's Feed-in Tariffs

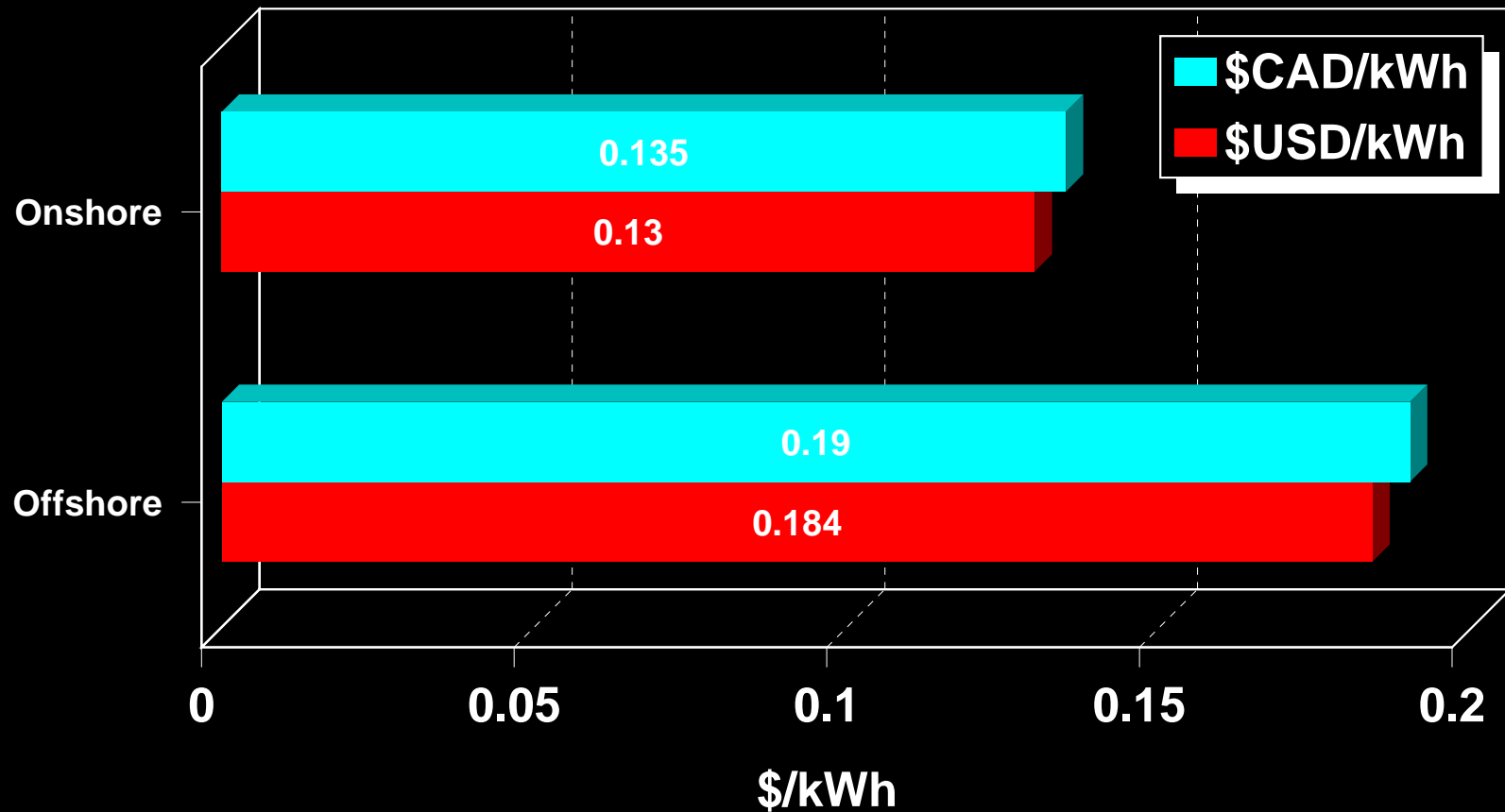
- **No Subsidies or Grants**
- **Costs Borne by Ratepayers**
Not Taxpayers--More Egalitarian
- **Community Wind Bonus**
Individual Farmers Qualify
\$0.01 CAD/kWh Bonus
\$0.145 CAD/kWh (€0.10/kWh)



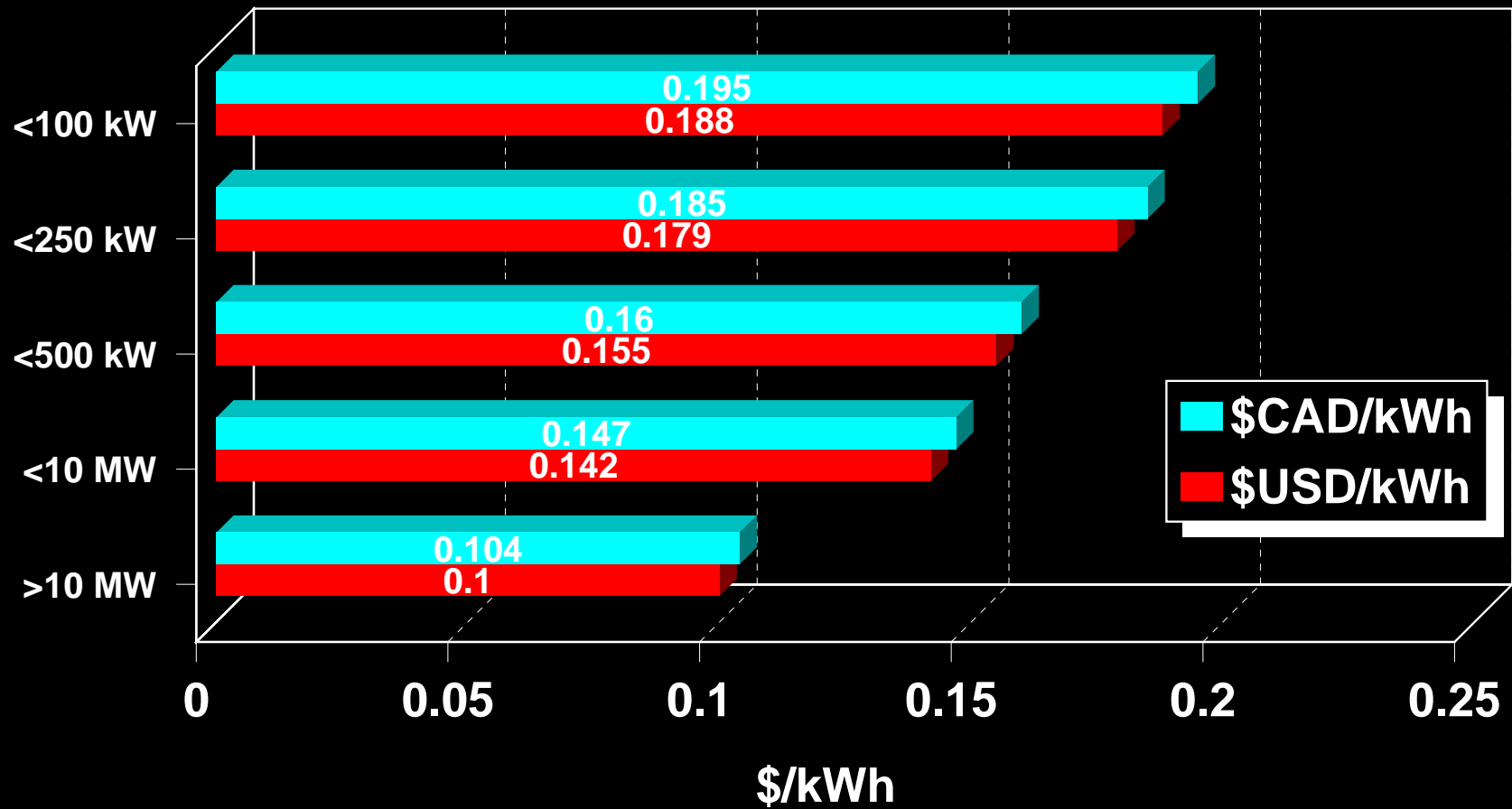
Ontario Solar PV Tariffs 2010



Ontario Wind Tariffs 2010

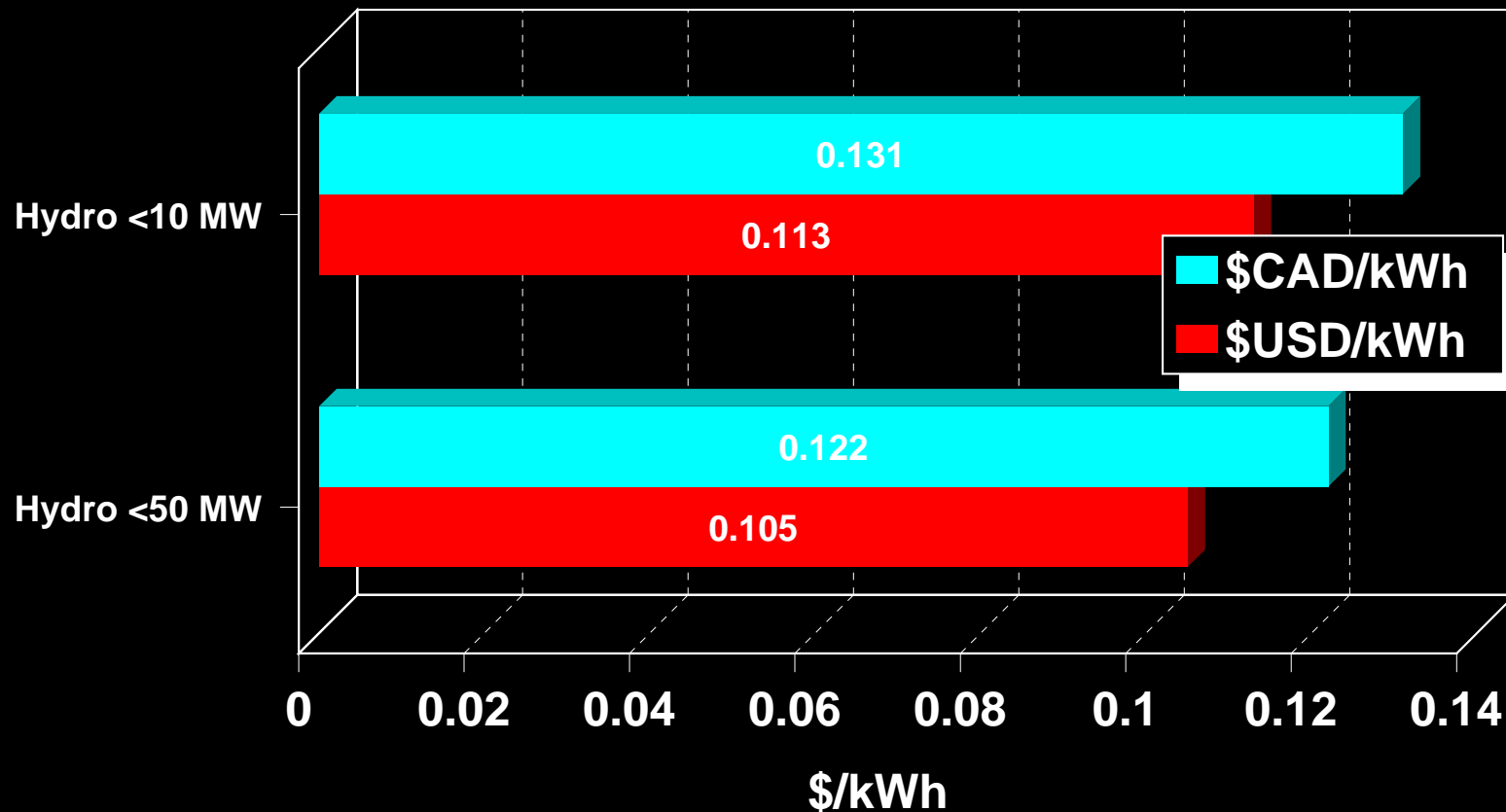


Ontario Biogas Tariffs 2010

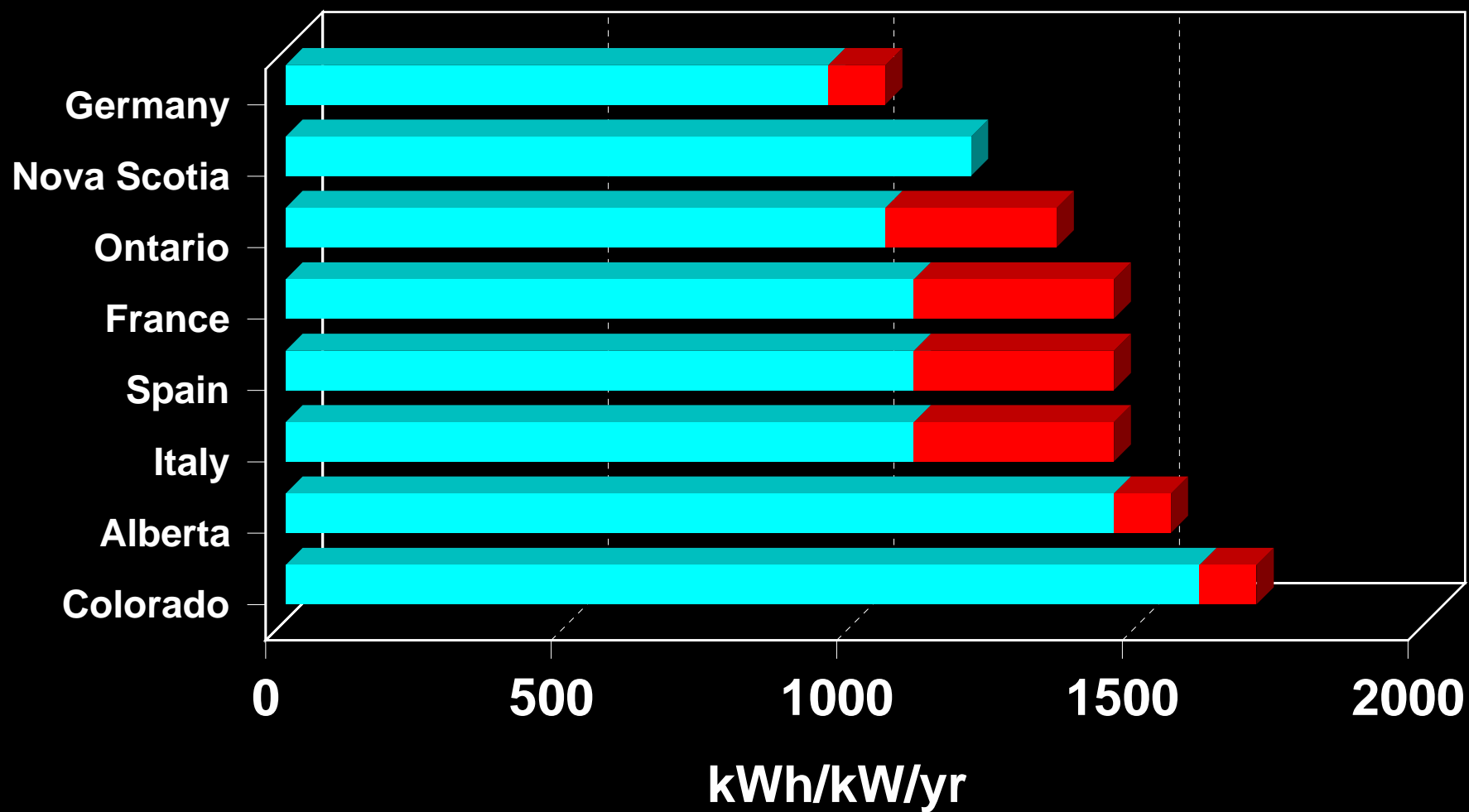


Ontario Hydro Tariffs 2009

Term: 40 Years



Solar PV Yields



Source: RetScreen

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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**

Ferndale, Ontario

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**



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Kingston, Ontario

Ontario Tariff Status

- **MicroFIT Revision August 2010**
Split into Two Tranches
Rooftop PV & Ground
- **2011 Program Review**

Toronto, Ontario

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**

Grading North American FITs

The Gold Standard

	Score	Grade
Germany	90	A
France	90	A
Spain (Fixed Tariff)	80	A-

Grading North American FITs

Existing FITs

	Score	Grade
Ontario (2009)	84	A-
Vermont	54	D
Maine	43	F
Wisconsin IOUs	36	F
California	28	F
Oregon	16	F

Grading North American FITs

Proposed FITs

	Score	Grade
Michigan	82	A-
Indiana HB1190	82	A-
California AB 1106	54	D

Making the Grade: What's Needed

Criteria

Program Caps

Project Size Caps

Contract Term

Multiple Technologies

Cost-Based Tariffs

Technology Differentiation

Technology Banding

Resource Differentiation

Best Practice

None or >20%

None or 20 MW

>20 years

Wind, Solar PV, Solar
DHW, Geothermal, CSP

For All Classes

Tariffs for Each Class

By Application & Size

Wind & Solar PV

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

North American Solar PV Market

Ontario Moves into Top Three

Rank		MW 2009
1	California	212
2	New Jersey	57
3	Ontario	46
4	Florida	36
5	Colorado	23

Ontario 2010: ~100-200 MW

Clear Sky Partners: ~800 MW/yr

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North American Solar PV Market

Ontario to Move into Top Three

Rank		Total Installed MW 2009
1	California	768
2	New Jersey	128
3	Colorado	59
4	Ontario	48
5	Arizona	46

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

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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**

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Husum, Germany

Renewables Can Be Added Quickly

	Wind 5 yrs	Wind 10 yrs	Solar 5 yrs
Germany	15 TWh/yr	35 TWh/yr	5 TWh/yr
Spain	15 TWh/yr	28 TWh/yr	5 TWh/yr

Germany Renewables: 10 Years--5% to 15%

Spain: 10 Years--0% to 10%

Colorado: ~53 TWh/yr

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High Penetration Quickly is Possible

	Percent Wind
France	1.2%
California	1.5-2.3
Germany	6.5%
Spain	14.3%
Portugal	15.3%
Denmark	21%

2009: Multiple Sources

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Cowley Ridge, Alberta

Political Price-Political Quantity Market Mechanisms

	Price	Quantity
Feed Law	Political	Market
Quota/RPS /Tendering	Market	Political

Both are Market Mechanisms

Ernst & Young Germany and Britain Cost of Renewables (2006)

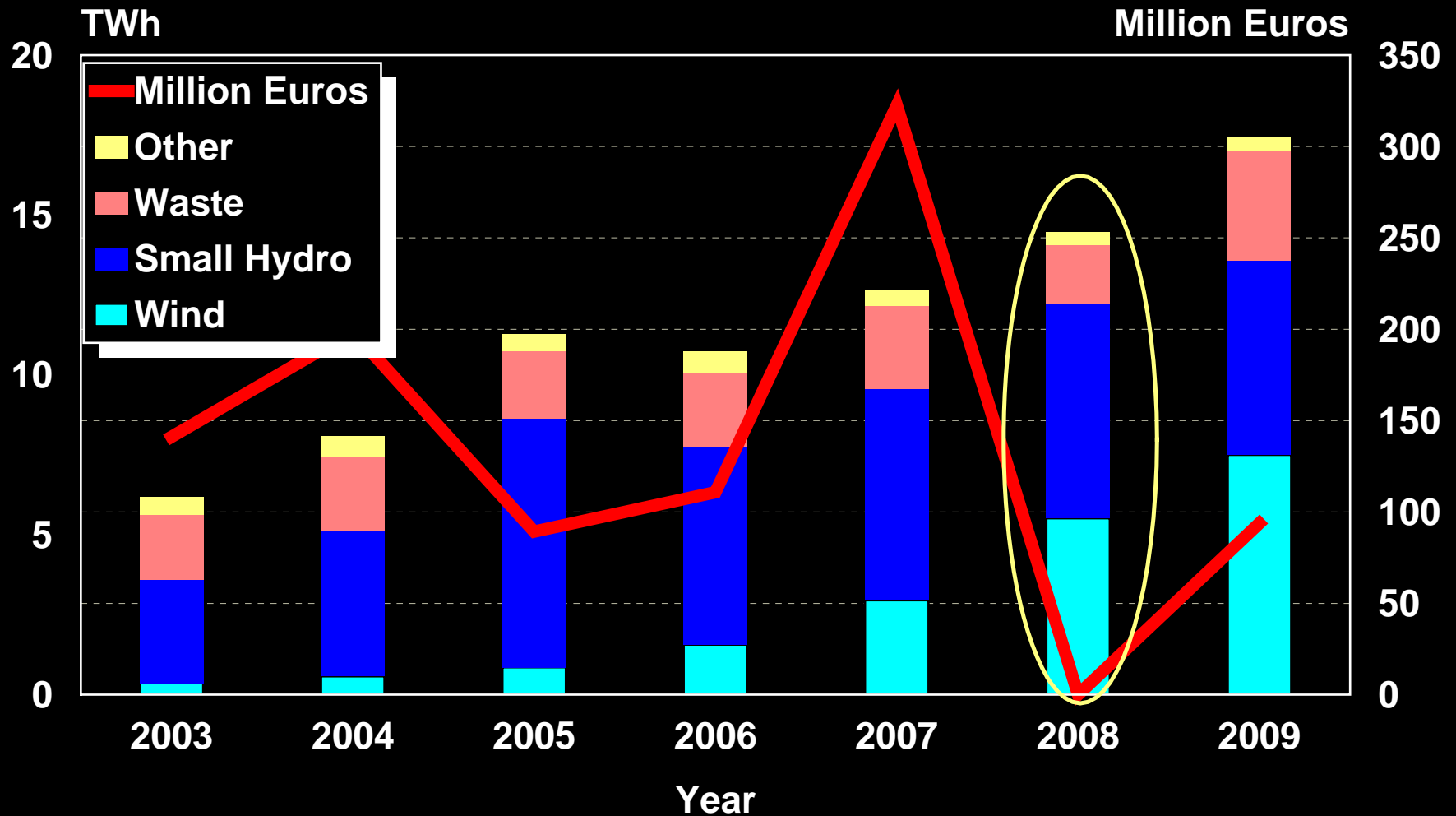
Manawatu Gorge, NZ

- Germany: 4x more energy generated
- Germany: @ 1/5 less relative cost of GB Renewable Obligation Certificates

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Over Cost of French Renewable Tariffs



Source: www.cre.fr

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European Projected Development 2010 with Feed-in Tariffs

	Wind	Solar PV
Germany	2,500	6,000
Spain	2,500	50-100
France	1,000	200
Italy	Quota	1,500

European 2010 Feed-in Tariffs

	Wind	Solar PV
Germany	Stable	2010 Cuts in Two Steps: New 3,000 MW Target
Spain	Possible Cuts	Further Cuts
France	Stable	Raised Tariffs: New Resource Differentiated Tariffs
Italy	Quota	2011 Cuts: New Target; 3,000 MW 2011-13

FIT Programs in Development

Finland

Great Britain

Malaysia

Philippines

Japan

Nova Scotia

Wind & Biomass

Renewable Heat

All Resources

All Resources

All Resources

ComFIT, no Solar PV

The Farmers of Nordfriesland

- **0.3% the Size of Alberta**
2,000 km²
- **560 MW of Wind**
Community-Owned, <1% of Land Area
- **1.3 TWh/yr**
2% of Alberta's Total Generation
As Much as All the Wind in Alberta
€100 million (\$130 million)/yr

Feed-in Tariffs

“Turn farms, homes, and businesses into entrepreneurs”

--Terry Tamminen, Former Chief Policy Advisor to Governor Arnold Schwarzenegger

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Goderich, Ontario

