

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, CAW, CEERT, DGW, DSF, EECA, ES&T, GEO, GPI Atlantic, IREQ, KWEA, MADE, Microsoft, ManSEA, MSU, NRCan, NRG Systems, NASA, NREL, NZWEA, ORWWG, OSEA, PG&E, SeaWest, SEI, TREC, USDOE, WAWWG, 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.

St. Olaf College V82, Northfield, Minnesota

Advanced Renewable Tariffs New Policy Option for North America by Paul Gipe

Paul Gipe, wind-works.org



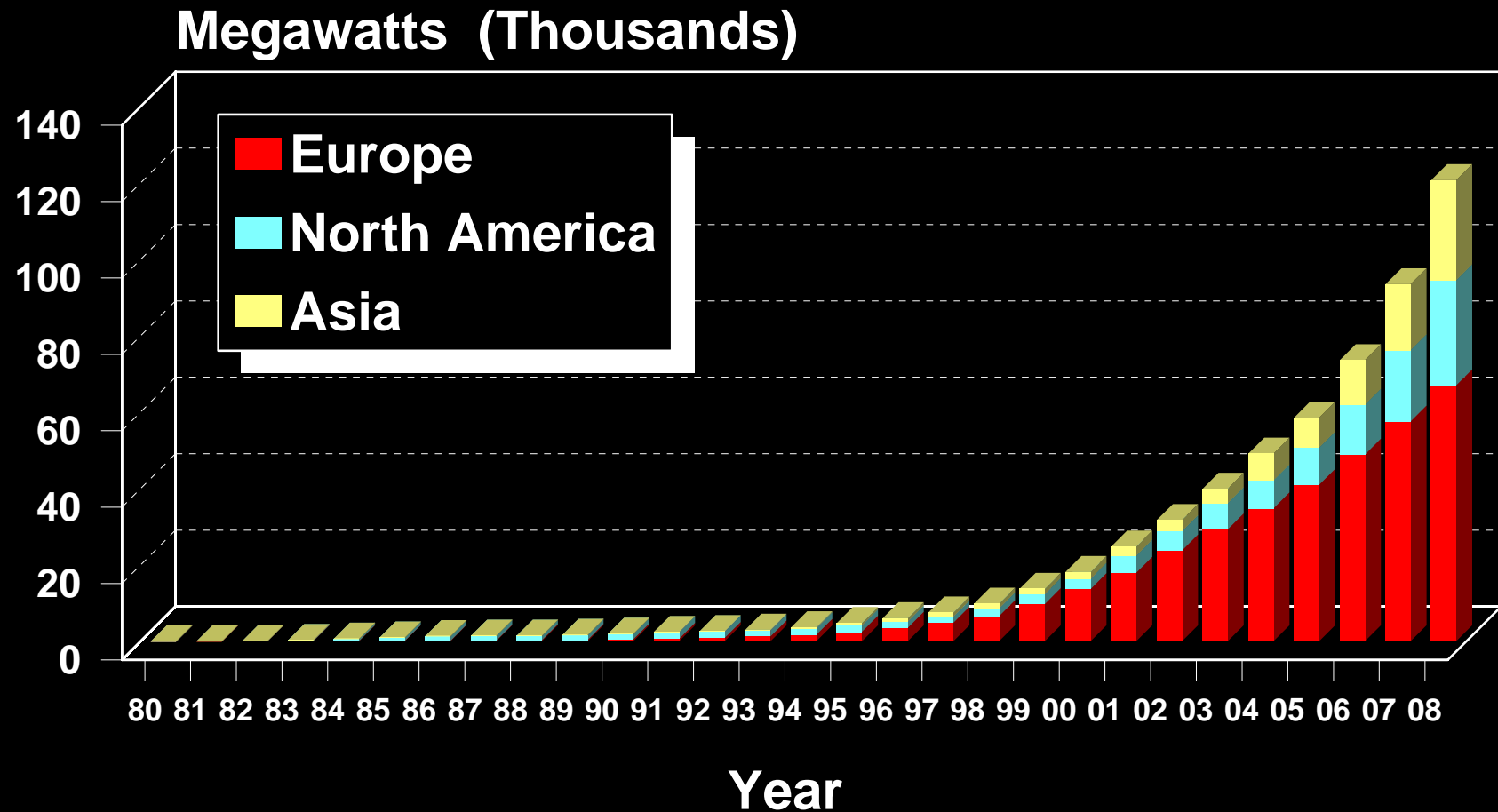
Noordoost polder, the Netherlands

Renewable Energy Has Come of Age

Paul Gipe, wind-works.org



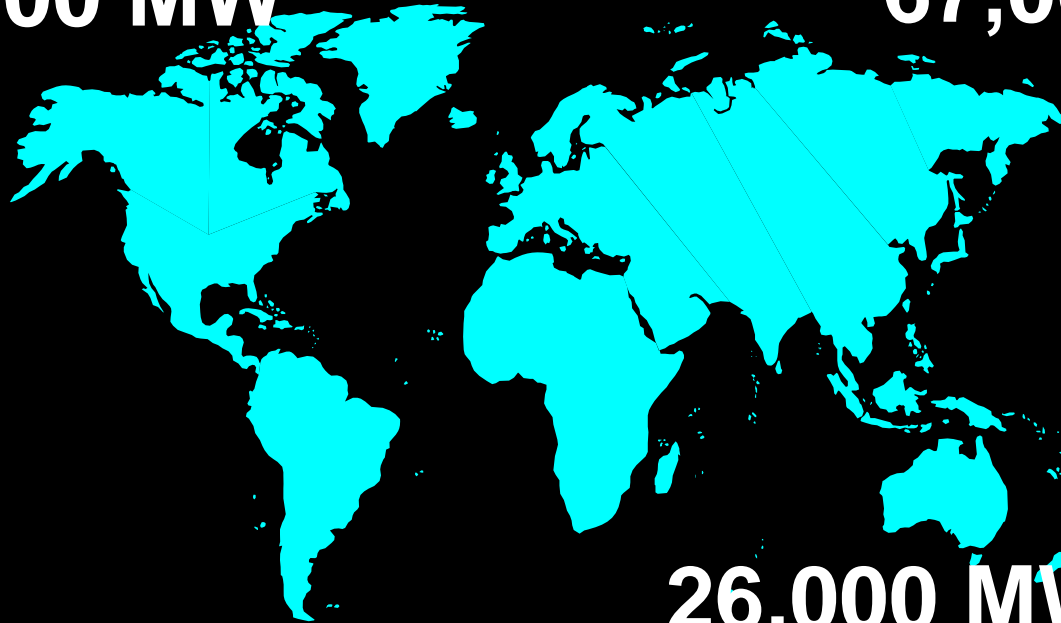
2008 World Wind Capacity



2008 World Wind Capacity

28,000 MW

67,000 MW



26,000 MW

We Know What Works ...and What Doesn't

Eole, Cap Chat



© Vortec



Paul Gipe, wind-works.org

Why Now?

- **Wind Works**

Greater Reliability

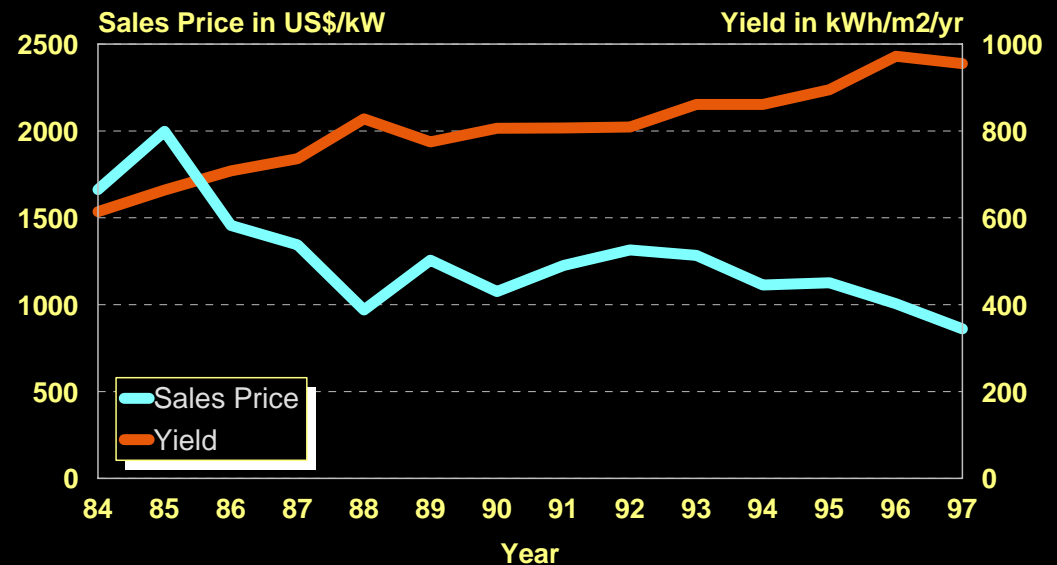
- **Productivity Improved**

More Efficient

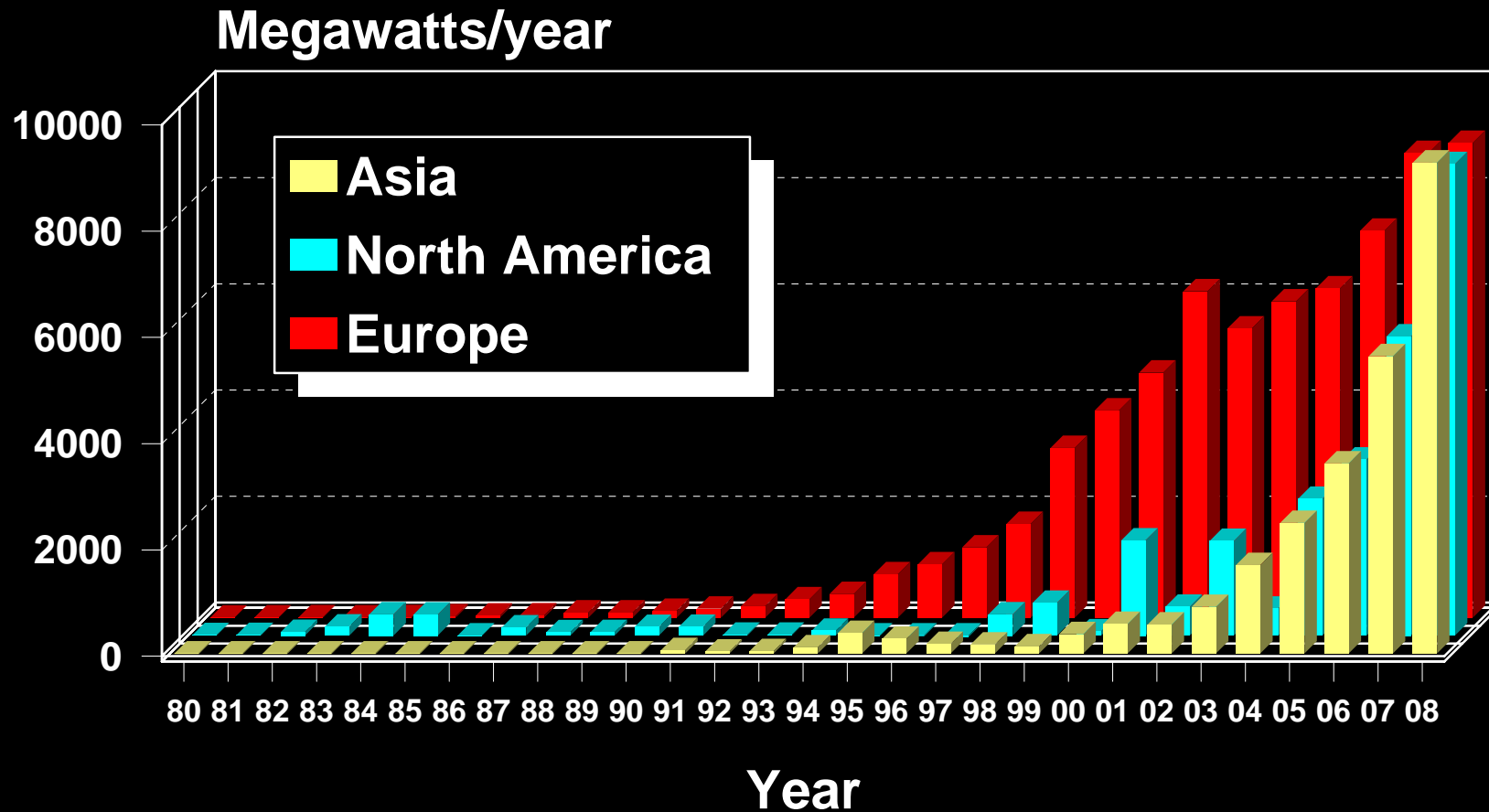
Taller Towers

- **Costs Declined**

Economies-of-Scale



Wind Capacity Growth by Region



Lackawanna, New York

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

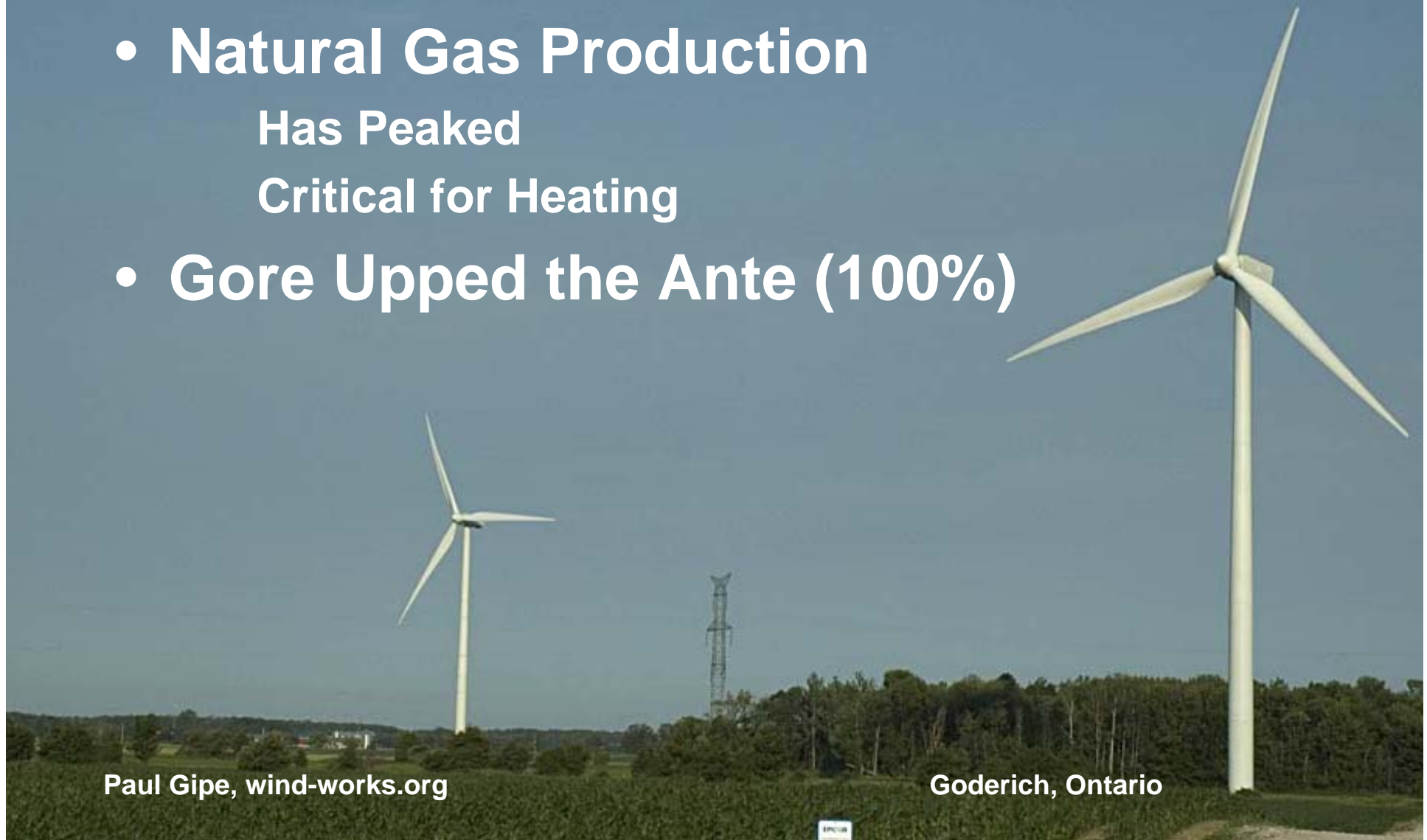


Profound Issues Confront North America's Energy Future

- **Natural Gas Production**
Has Peaked
Critical for Heating
- **Gore Upped the Ante (100%)**

Paul Gipe, wind-works.org

Goderich, Ontario



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



North American RE Market Growth

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

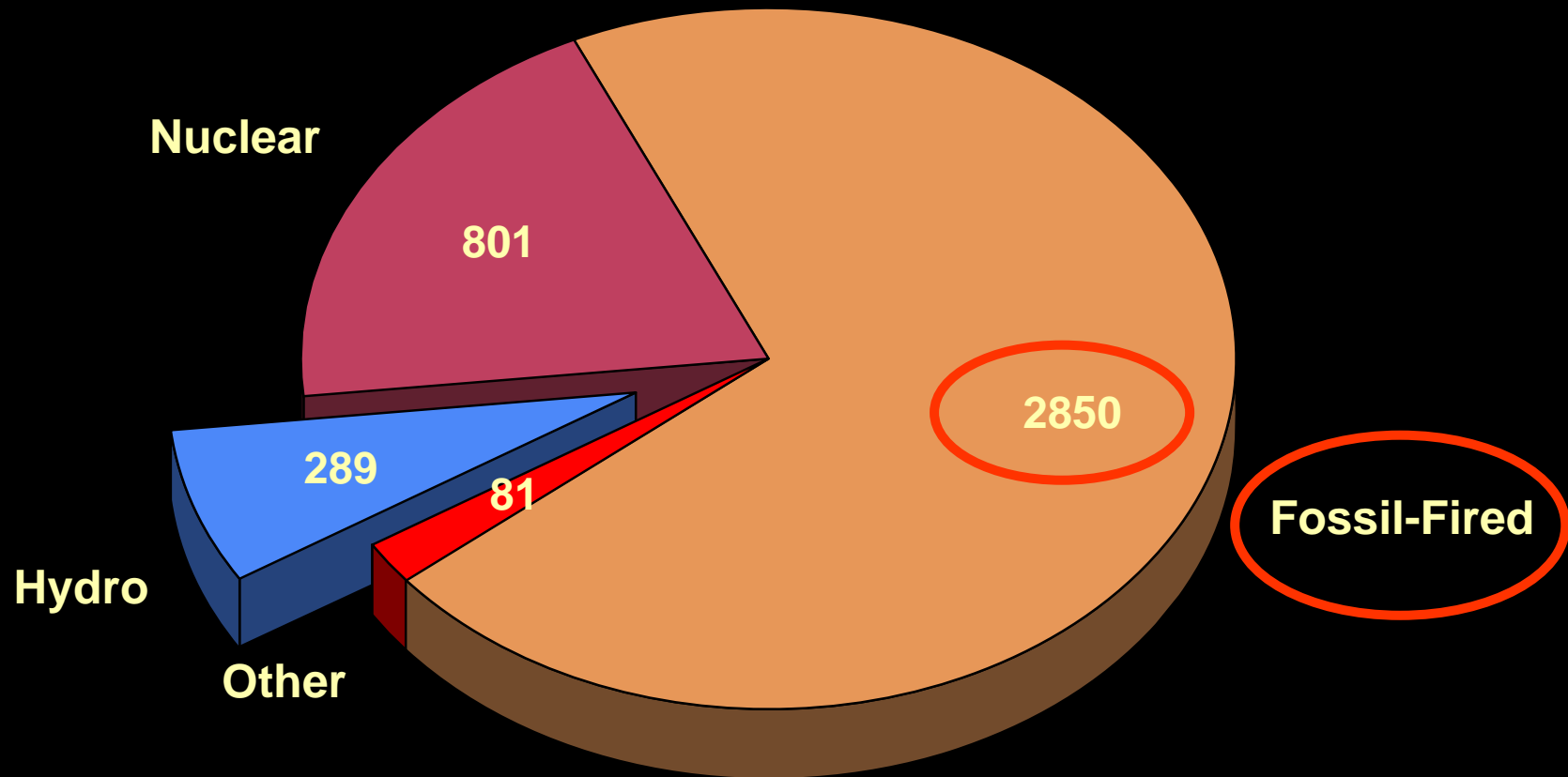
Paul Gipe, wind-works.org

Buffalo Ridge, Minnesota



US Electricity Generation

~4,000 TWh/yr

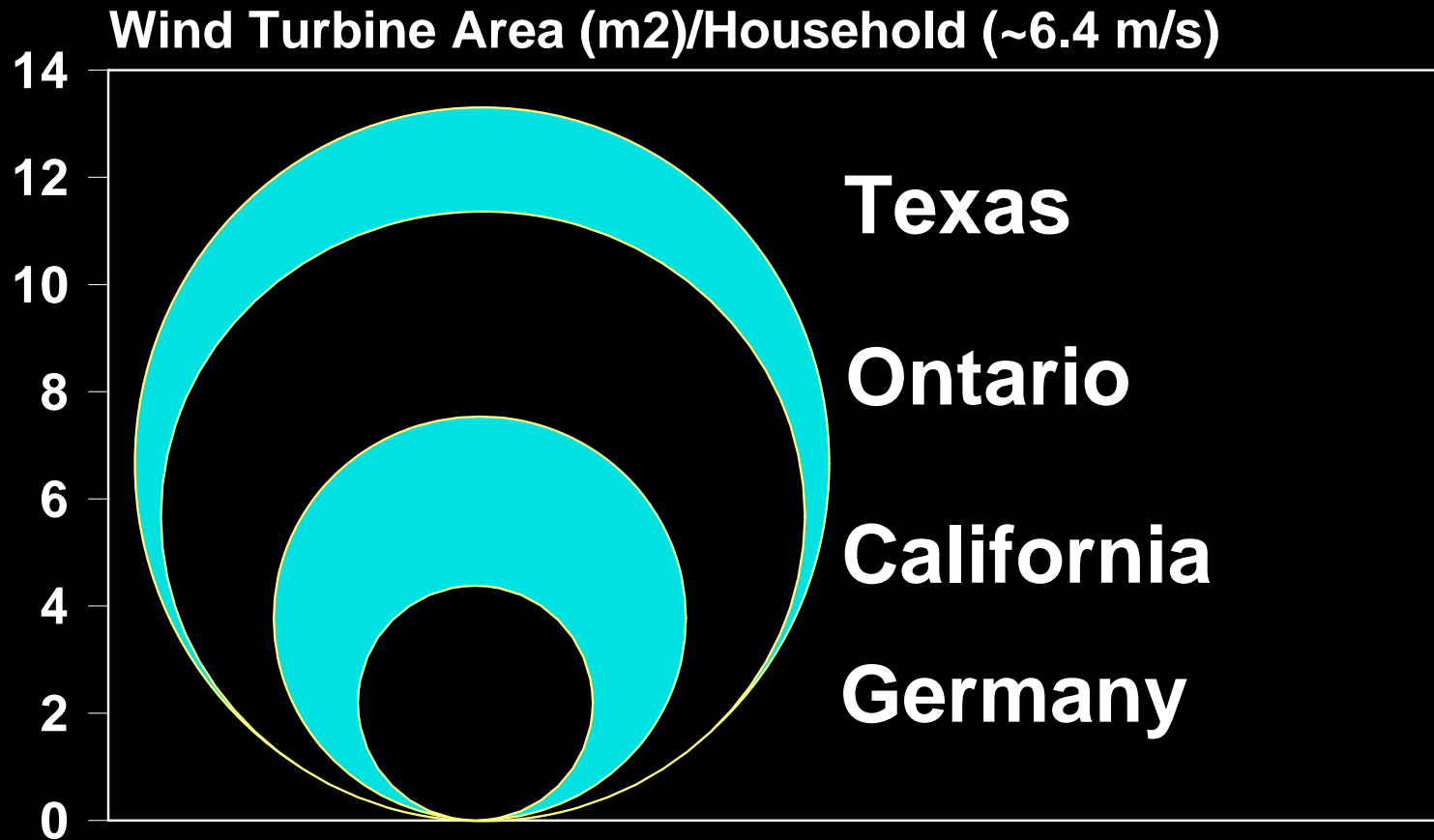


Scale Needed: North America

- ~2,500,000 MW
- ~120x Today!



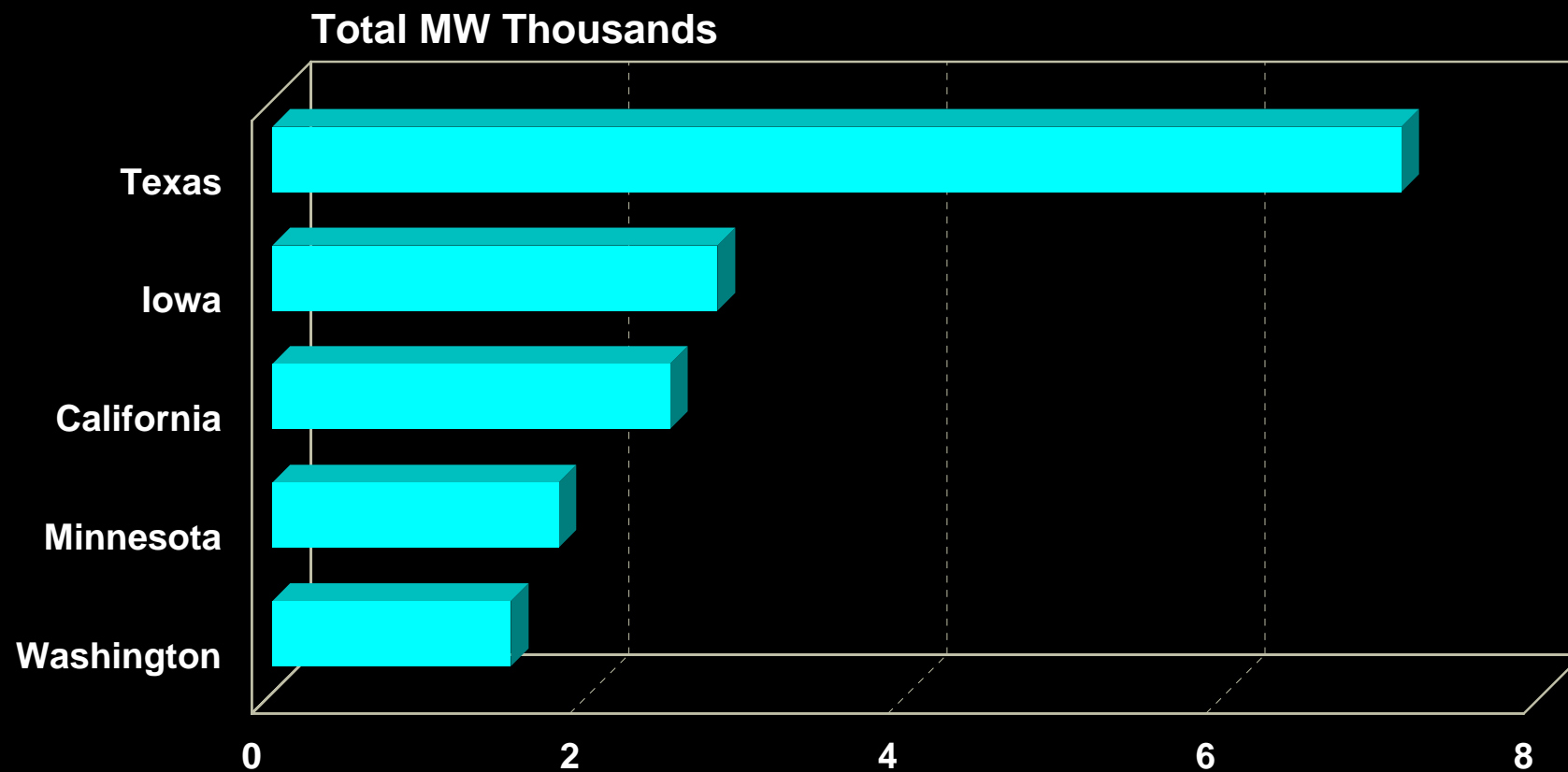
Swept Area per Household



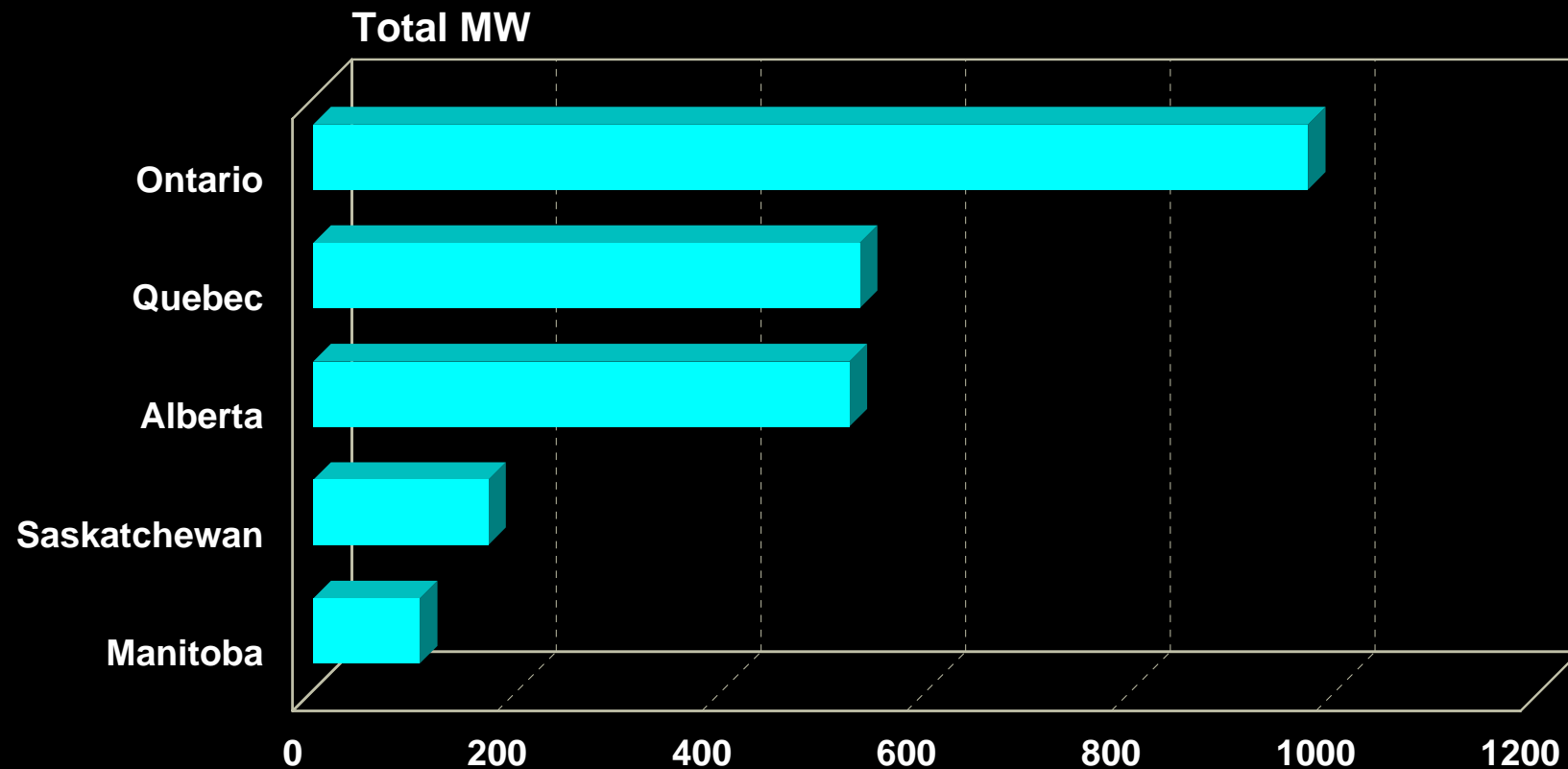
North American Wind Capacity 2008



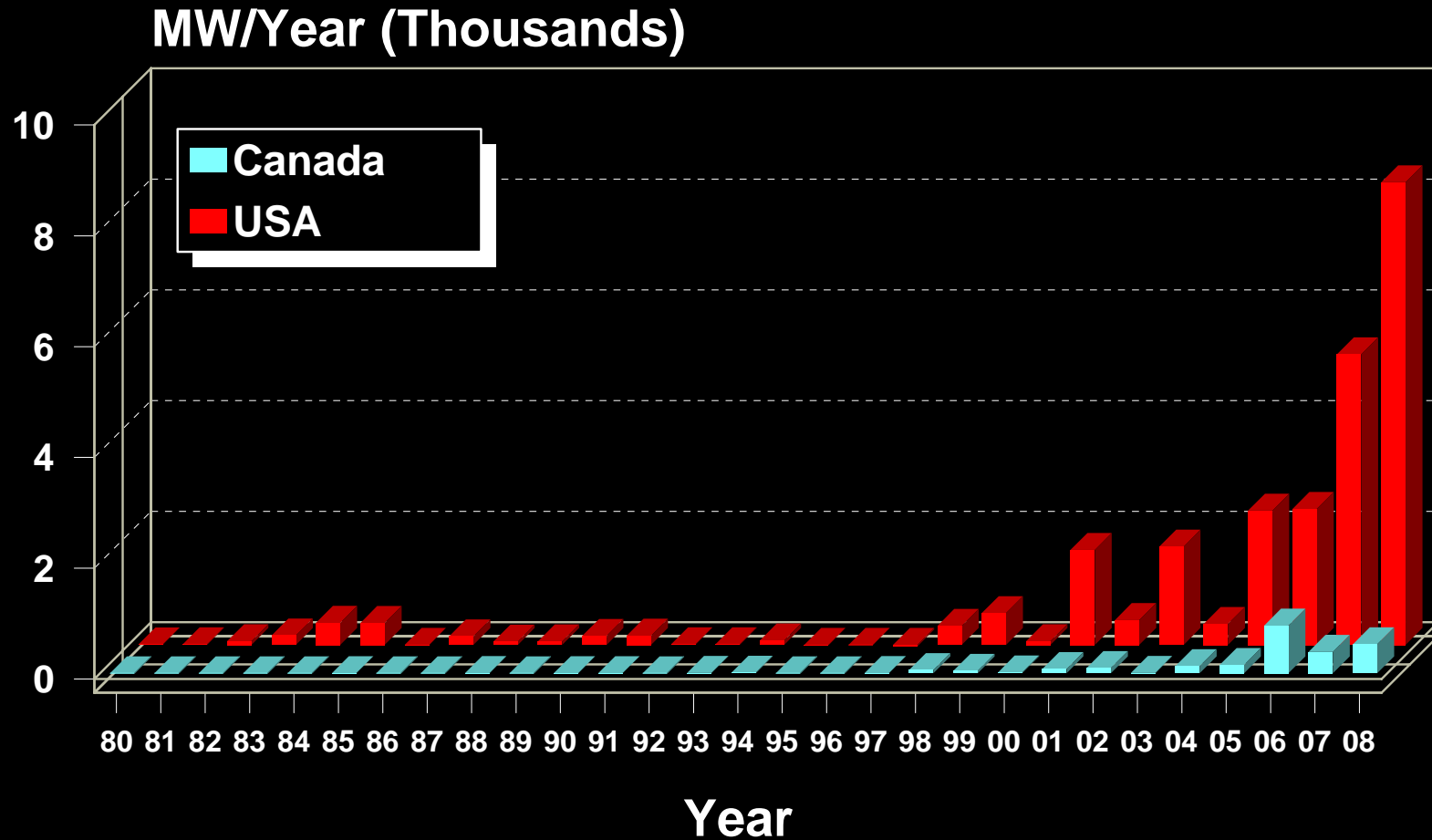
2008 US Major Wind Markets



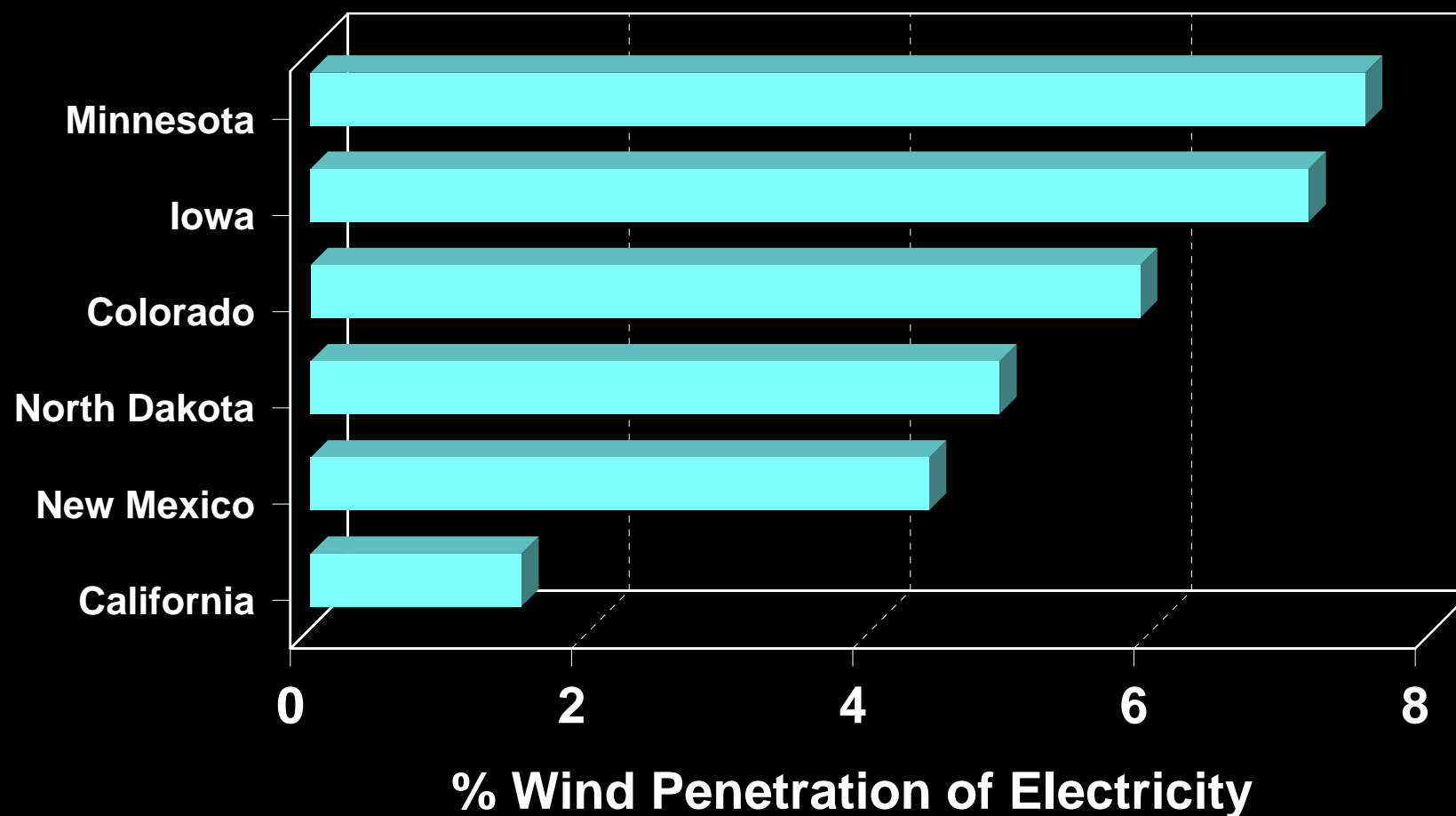
2008 Canadian Major Wind Markets



US-Canada Wind Market Comparison



Wind Penetration in the USA



Why the European Success?

#1 Community Involvement

Germany & Denmark

#2 Advanced Renewable Tariffs

18 EU Countries use Electricity Feed Laws



Public Acceptance Critical

- **Acceptance Necessary**
For Continued Political Support
- **As Renewables Grow**
Entrenched Players Threatened
- **Organized Opposition Grows**
Coal & Nuclear Industry

No to Windmills

Paul Gipe, wind-works.org



Community Wind--The Third Way

Wind Energy As If People Matter

1. Large Wind Power Plants
2. Small Wind Turbines
3. Locally-Owned Commercial Turbines



WindShare Meeting,
Toronto, Canada

Paul Gipe, wind-works.org

Increasing Acceptance #1

“Your Own Pigs Don’t Stink”

Paul Gipe, wind-works.org

Jutland, Denmark



Building Acceptance

- Must Share Opportunity
- Public Must Participate
- For Renewables To Reach Their Potential

Paul Gipe, wind-works.org

Schauinsland, Germany

What is Community Power?

- **Local**
Responsible to the Community
- **Locally Owned**
Cooperatives, First Nations, Farmers,
Homeowners
- **Commercial-Scale Generation**

Community Power

- Greater Acceptance
- More Power More Quickly
- More People Involved Locally
- More Money Locally
- More Jobs Locally

Danish Co-ops

(*Vindmøllelaug* or *Fællesmølle*)

- 1/4 Capacity Nationwide
- ~ \$1.7 Billion
- 100,000 Households Own Shares
- 5% of Population



Thyborøn-Harboøre Vindmøllelaug



Anton Bro

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

Paul Gipe, wind-works.org



©Bonus a/s

Co-Op & Farmer-Owned Wind

	Farmer	Co-op	Corporate
The Netherlands	60%	5%	35%
Germany	10%	40%	50%
Denmark	64%	24%	12%
Great Britain	1%	1%	98%
Spain	0%	0%	100%

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

Community Wind--The Third Way

Is North America Being Left Behind?

- No
Time to Get It Right
- It's Not Easy Here
Frustrating? Yes!
- Only the Beginning
Minnesota
Ontario

Paul Gipe, wind-works.org

Chateau de Lastours, France



Distributed Wind Energy in North America

- **Niche Market?**
- **Major Potential?**
- **Upper Midwest**
Minnesota & Iowa
- **Southern Plains**
Texas--Yes, Texas!
- **Canada**
Ontario--Slow Start
- **John Deere**

Paul Gipe, wind-works.org



Community Wind is About People and Opportunity



Paul Gipe, wind-works.org

What Do Farmers Need?

- Higher Tariffs
- Priority Connection
- Priority Purchase
- Simpler Permitting
 - German Farmers are “Privileged”
- Anglophone Val-Éo Model
- Stronger Distribution System
 - Ontario’s System Antiquated



Potential per Farm

- 2MW Turbine, 80 m Ø, 80 m Tower
- ~\$4 million Installed
- ~3.5 million kWh/Year (~6 m/s)
- ~\$350,000/yr @ \$0.10/kWh
- Simple Payback: 11 Years
- After Payback: ~\$350,000/yr

Minnesota Distributed Wind

	MW	%
Small Developer	104	12%
Farmer Owned	74	8%
Locally Owned	72	8%
Municipal Utility	19	2%
Rural Electric Cooperative	6	1%
College/University	5	1%
School	1	0%
Total	281	31%

Source: Windustry.org, March 2007

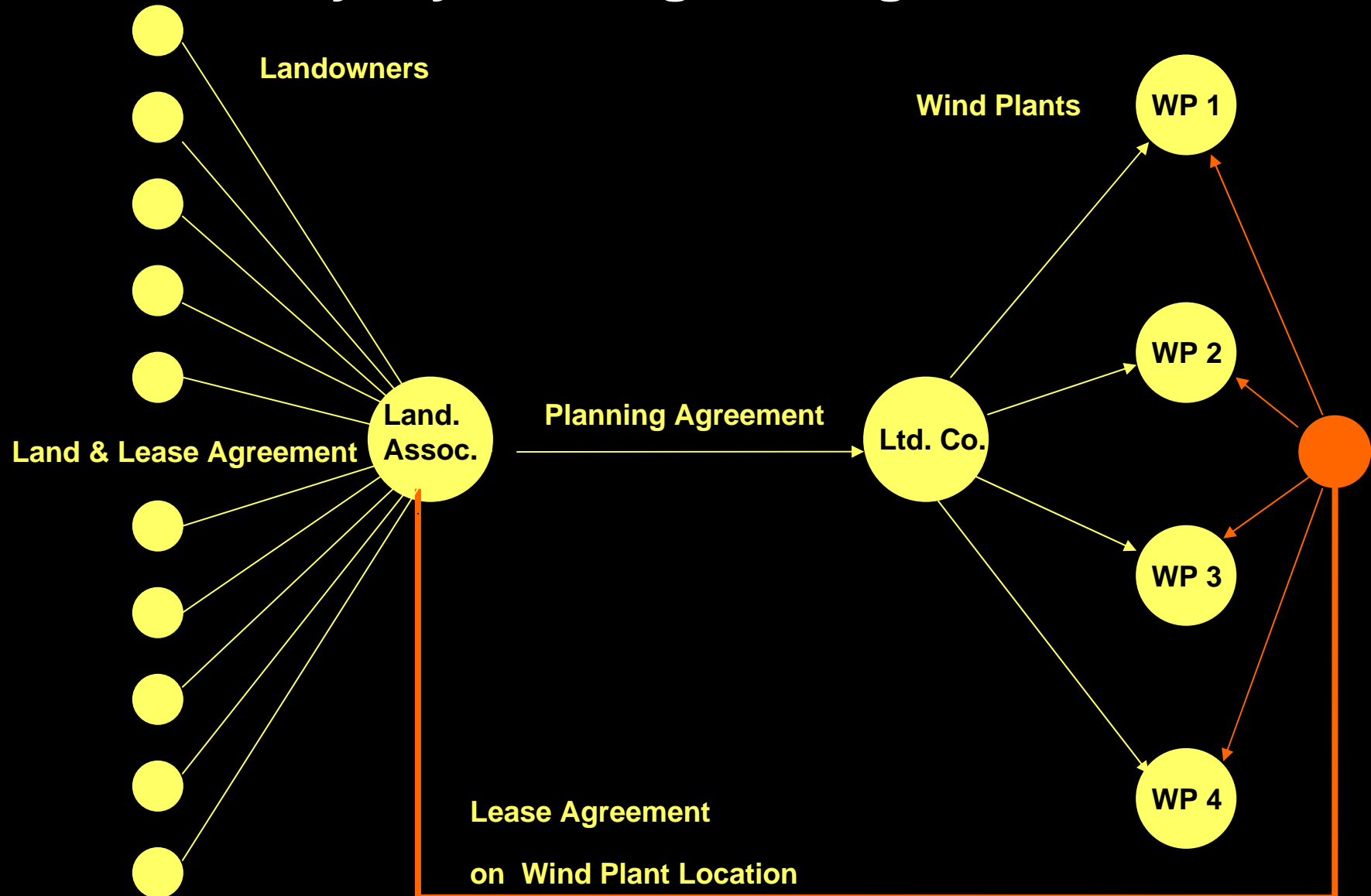
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Royalties & Land Rents

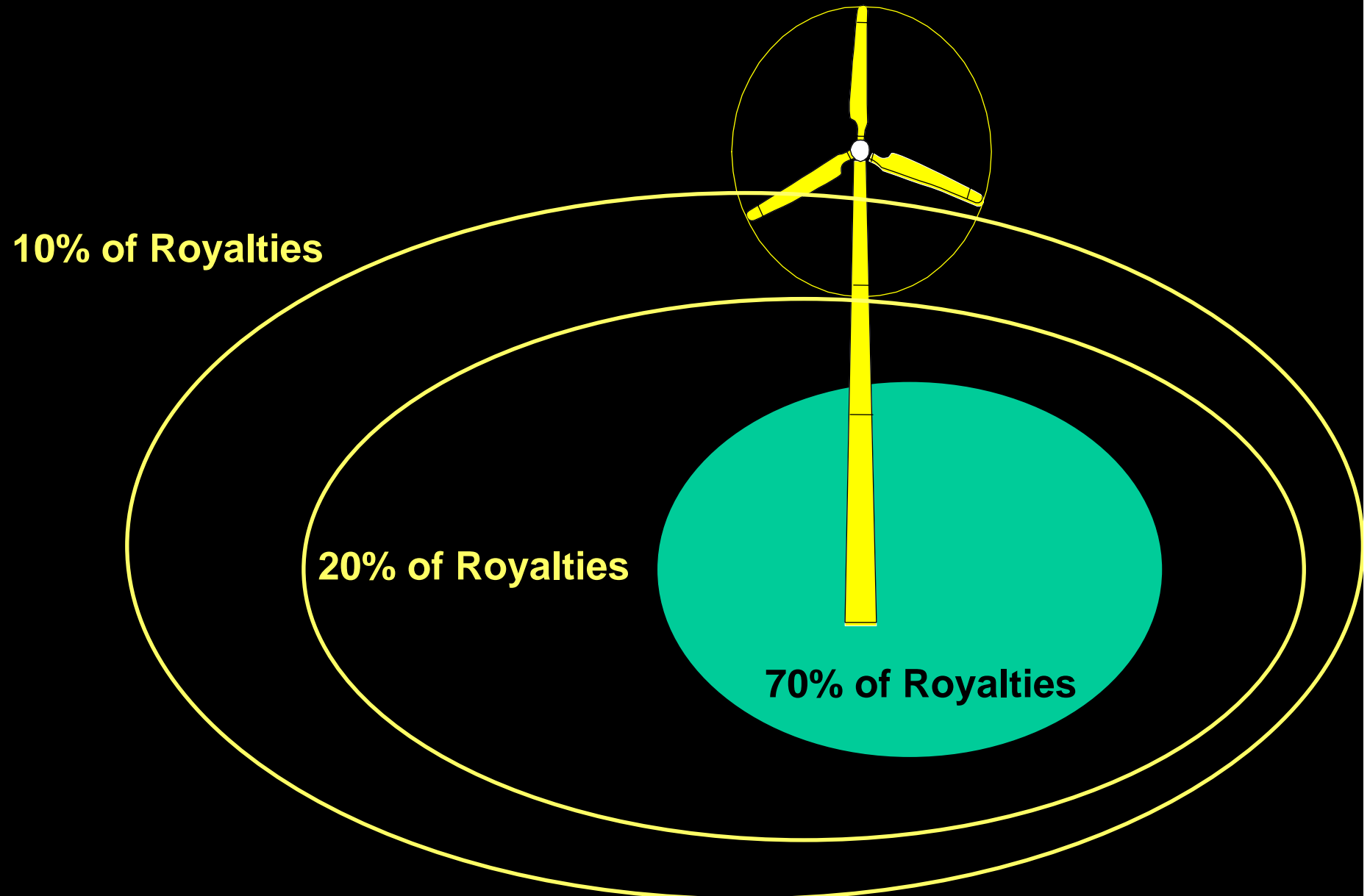
	1-10	10-20	20-30
Coastal Germany	5-8%		
Interior Germany	3-5%		
Cielo Wind Power, NM	6%		
Cappeln Germany	4%	5.9%	5.7%
Indian Mesa, TX	4%	6%	8%
Woodward Mesa, TX	4%	6%	
US BLM, CA	4%		
Freiburg, Germany	3.8%	5.4%	
Portugal	2.5%		
Ontario	1.5-2.5%		

Paderborn Co-op

Royalty Sharing Among Farmers



PEI Royalty Revenue Sharing



Community Wind in North America

- **Minnesota C-BED**
- **Hull, MA**
- **WindShare, Toronto**
- **Elkhorn Wind (80 MW)**
33% of “Payments” in Nebraska
- **Bear Mountain Wind (120 MW)**
British Columbia
Small Equity Interest by Peace River Co-op

Hull, Massachusetts



- 95% approval
- V47
- V80, 1.8 MW
- Future: 4 offshore turbines

Andrew Stern, Hullwind.org

Community Wind in the USA

- 300 MW 2006 (MN)
- 300 MW in Development
- Local Banks Syndicate Loans
- Democratizes Energy

Paul Gipe, wind-works.org

Montfort, Wisconsin

Minnesota's Community-Based Energy Development (C-BED)

- **100 MW Signed Contracts**
- **300 MW “On the Table”**
- **900 Applications**
- **PUC Approves Each Contract**
- **No Capacity Limit**
- **Governor 800 MW C-Bed by 2010**

Minnesota's Community-Based Energy Development (C-BED)

- **Intended for Locally-Owned Wind**
- **Depends upon Aggressive Tax Design**
- **Depends upon High Wind Speeds**
- **Revenue Stream Very Low in Later Years**

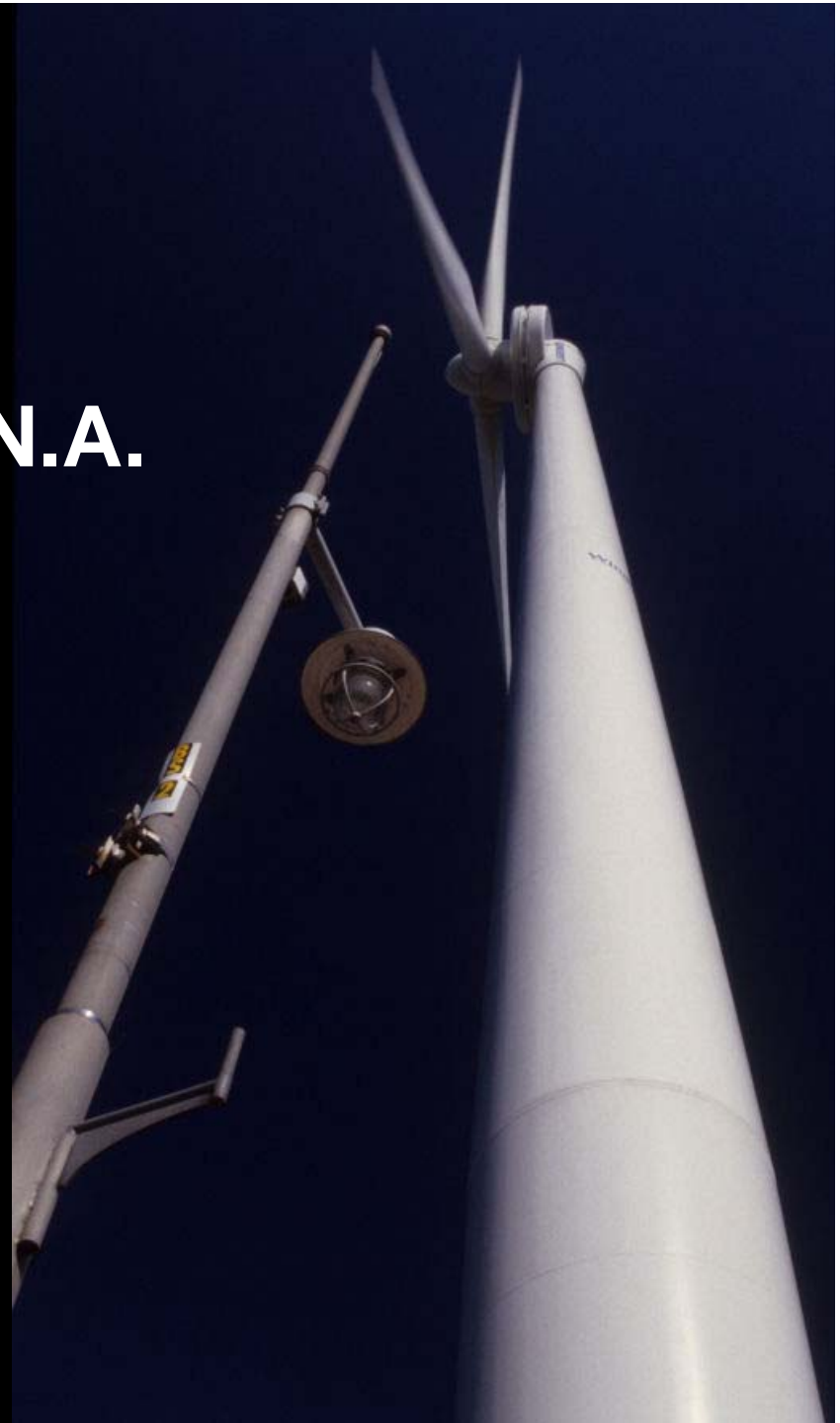


Buffalo Ridge, MN

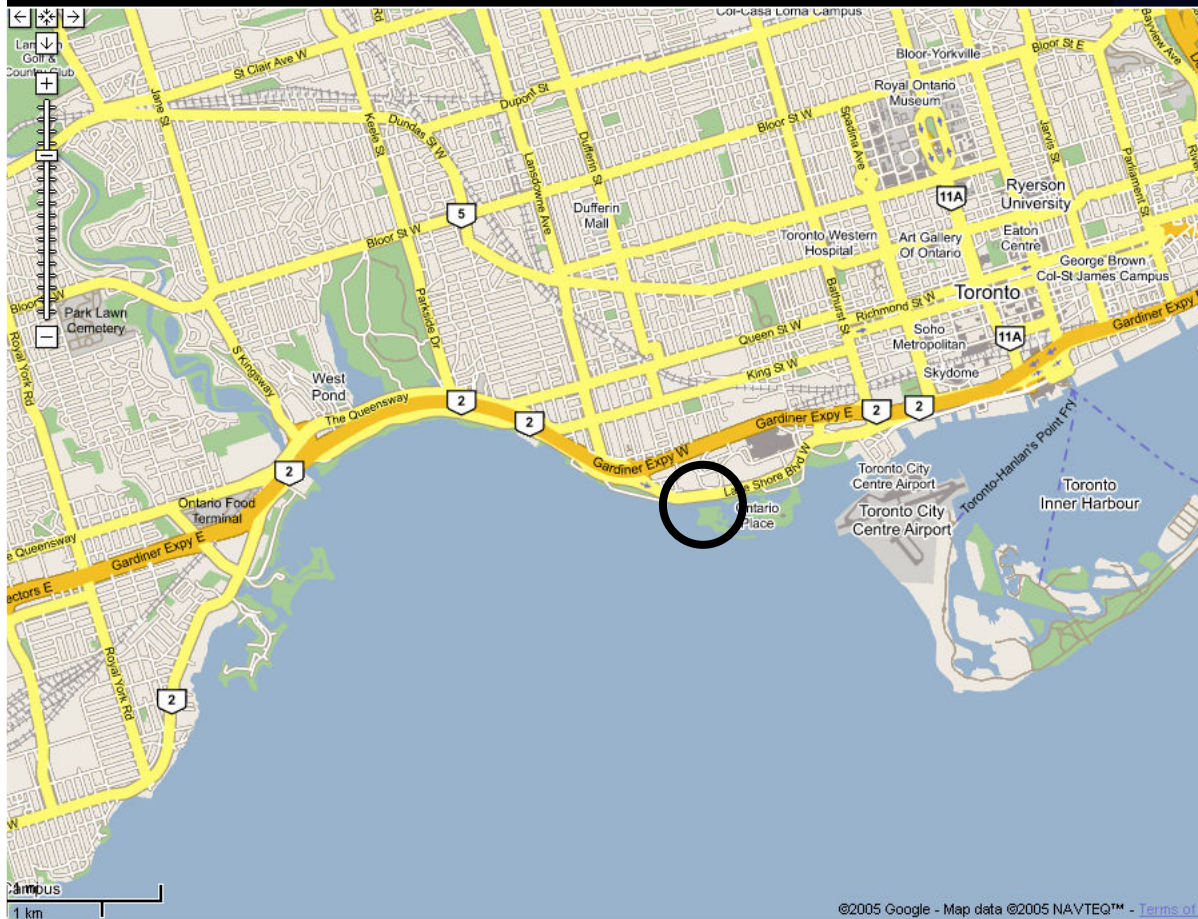
WindShare Toronto, Canada

- **First Urban Turbine in N.A.**
- **Co-Owned**
WindShare Co-op
450 Members
Toronto Hydro
- **Prominent Location**
- **Highly Visible**
- **Highly Popular**

Paul Gipe, wind-works.org



WindShare Toronto, Canada



Toronto WindShare



Paul Gipe & Assoc.

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



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

San Geronio Pass, California



Differentiated Tariffs for Wind

- **Increases Program Flexibility**
Lessens Pressure to Get Prices Right the First Time
- **Reduces Development Risk**
Determining Final Price After 5 Years of Operation
- **Spreads Opportunity to All**
Not Just to Elite Few
- **Provides Fair Profits at Modest Wind Sites**
- **Limits "Excessive Profits" at Windy Sites**

Market Mechanisms Status

- Renewable Tariffs Developing Momentum

Paul Gipe, wind-works.org

Montjoyer, France



Renewable Tariffs in North America .. Unthinkable?

- Yes--Just 4 years ago
- Today? No
- Now Possible
- Growing Trend
in both USA & Canada

Paul Gipe, wind-works.org



Gaspé, Quebec

The Mood Has Changed

- Ontario Moved First



Paul Gipe, wind-works.org

Montfort, Wisconsin

Ontario's Standard Offer Program

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

Paul Gipe, wind-works.org

Goderich, Ontario

Why?

- **All Renewables**
First in North America
- **Open To All Players**
First in North America
- **Differentiated Tariffs**
Two (Solar & Everything Else)
First in North America
- **Simplified Contracts**

Paul Gipe, wind-works.org

Toronto, Ontario



Ontario's Standard Offer Program

- **<44kV, <10 MW**
- **Wind, Solar, Hydro, Biomass**
- **Inclusive--Open to All**
- **No Program Cap**



Ontario's Standard Offer Program

- Wind, Hydro, & Biomass: \$0.11/kWh
- Solar PV: \$0.42/kWh
- Inflation Adjustment: 20%
Except for Solar PV (Punitive?)
- 20-Year Contracts

The “Ontario Model”

- **Adapted European Models to Ontario**

Examined German, French, Spanish Systems

- **Focused on Wind & Solar**

Hydro & Biomass Placeholders

- **OSEA Criteria**

Enabling Community Ownership

(Farmers, Homeowners, First Nations, Small Businesses)

- **Adapted French Wind Tariffs**

Why German & French System?

- **Enables Community Participation**
More People Can Benefit
- **Broader Geographic Distribution**
More People Can Benefit

French Wind Tariffs

Resource Productivity Method

- Fair Profits at Medium Wind Sites
- Not “Undue” Profits at Windy Sites
- Price Adjusted for Inflation 60%
- Profitability Index Method (Chabot)

Goderich, Ontario

Ontario “Gets It”

First Modern System of Advanced Renewable Tariffs in North America

Paul Gipe, wind-works.org



Ontario's Green Energy & Green Economy Act

- **Multi-faceted (Affects 5 Acts)**
- **Efficiency & Conservation**
- **Renewable Energy**

Consistent Enforcement of Siting Guidelines

Procure Through Feed-in Tariffs

- **Hearings Underway Soon**
- **Passage Expected in Late May**

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
Nano Solar "Interested"
Everbrite 1/2 Billion Plant: 1,200 jobs

Ontario Power Authority's Proposed 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!)**
- **No Project Size Cap**

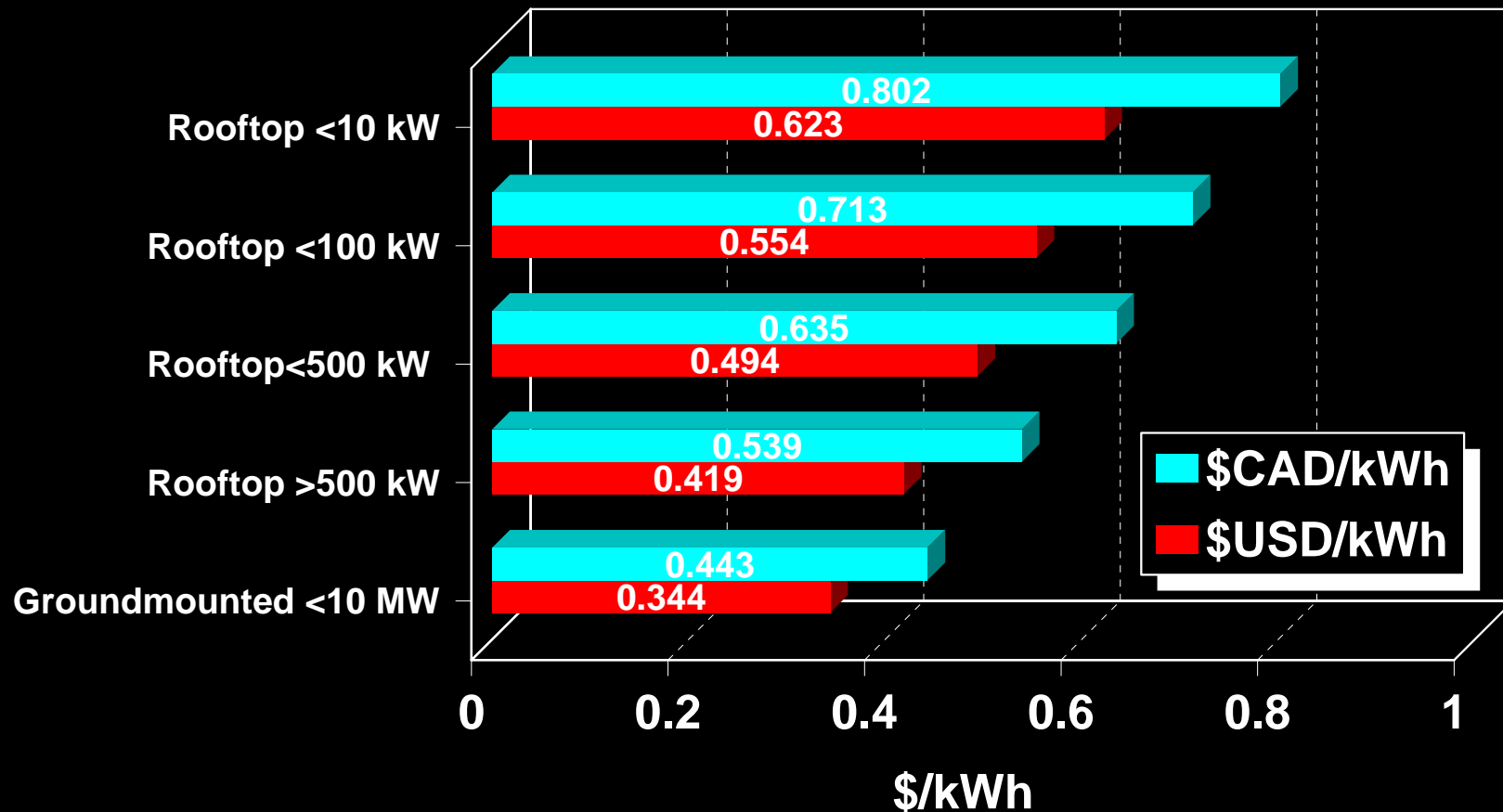
Exception: Groundmounted Solar PV < 10 MW

Ontario Power Authority's Proposed Feed-in Tariffs

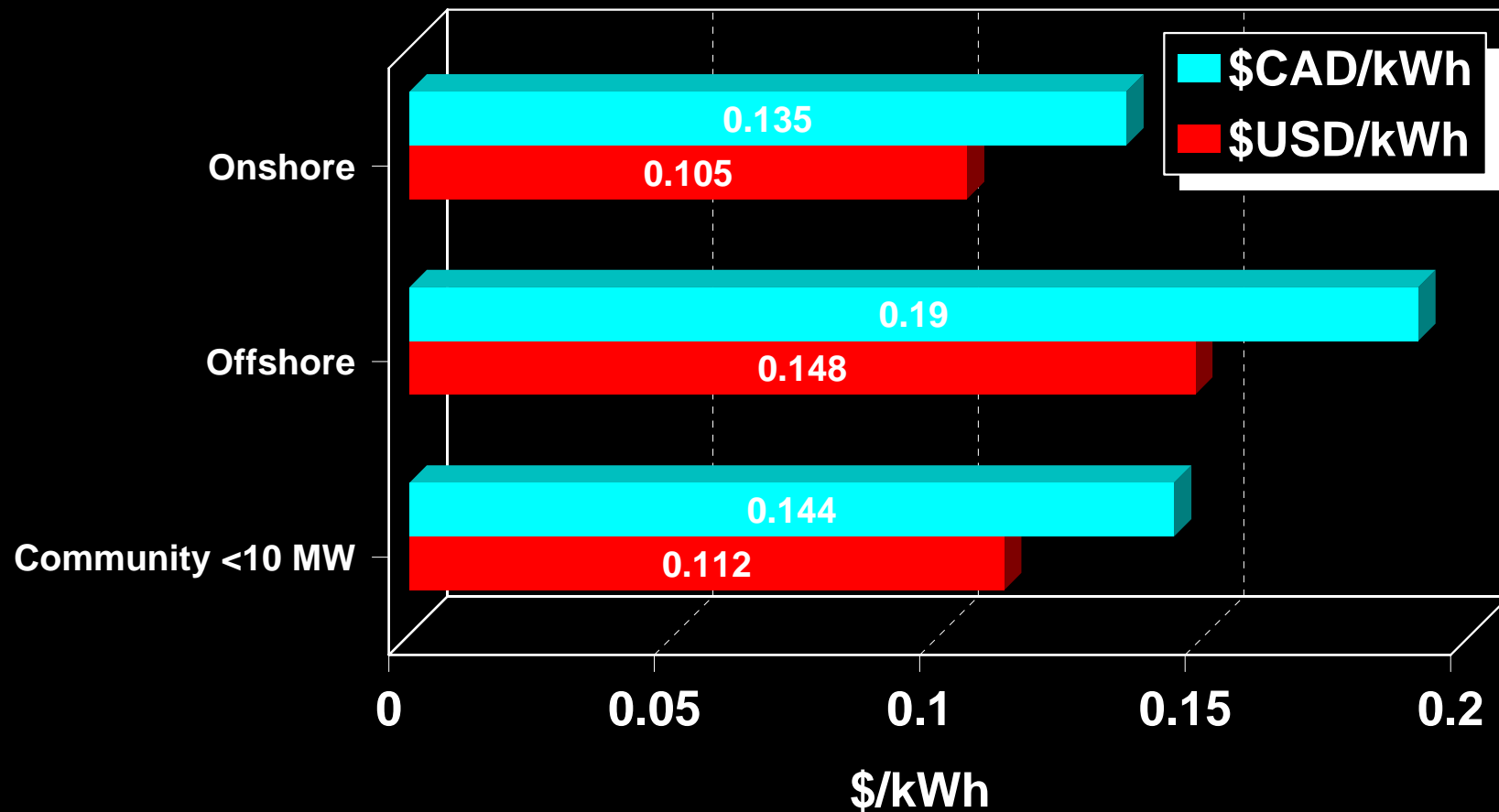
- **Stakeholder Engagement Underway**
- **Detailed Rules Proposed**
Based on Experience with RESOP
- **Additon of Renewables**
Determines Grid Upgrades & Expansion
- **Rules in Place ~June 2009**



Ontario Solar PV Tariffs 2009



Ontario Wind Tariffs 2009



ARTs Feature Comparison

	Germany	France	Spain
ARTs	Yes	Yes	Yes
Cost-Based Tariffs	Yes	Yes	Yes
Program Limits	No	Yes	Yes
Term	20	15-20	25+
Inflation	No	Yes	Yes
Solar Tiers	5	5	3
Wind Offshore	Yes	Yes	No
Wind Tiered Tariffs	Yes	Yes	No
Wind Tiers	Continuous	Continuous	n/a
Community Power	Yes	Yes	No

Grassroots Movement Has Begun

- **Explosion of Interest**
- **Groups Active Across Canada**
- **Local Groups Now Active Across US**
Most Within the Past 12 Months!
- **Public Out in Front**
Demands Aggressive Action
- **Tipping Point Reached?**

“Change” in the Air?

- **Obama Elected**
Was Once Unthinkable
- **CEC Recommends Feed-in Tariffs**
California May Move Quickly in 2009
- **California Cities Now Considering**
Palm Desert, . . . Los Angeles?
- **Gainesville, Florida Municipal Utility**
First True Solar PV Tariff in USA (March)

Ferndale, Ontario

Renewable Tariffs Are In Play

- New Brunswick
- Michigan, Illinois, Indiana!
- Minnesota & Maine
- Florida!
- California--Feed-in Fever

Paul Gipe, wind-works.org



Michigan's Renewable Energy Sources Act

- Reduce Price Volatility
- Reduce Long-Term Prices
 - Pay Little More Now
 - Avoid Paying More Later
- Reduce CO₂ Gases
- Create New Jobs

Challenges in North America

- **Piecemeal Policy Approach**

Too Slow

Existing Policy Momentum

RPS for Wind, Subsidies for Solar

- **“Cheap Energy Contract”**

Cheaper Today

--More Expensive Tomorrow



Barriers to Renewable Tariffs in North America

- **Philosophical: Cost vs Value**
Cost of Generation Plus Fair Profit
- **Sticker Shock**
Imbedded Costs of Heritage (Old) Resources
Natural Gas: Future Cost?
Nuclear: Cost Estimates & Reality
- **Unfamiliarity**
- **Tax Subsidies Distort Market in USA**
Complicate Program Design

Strategy--Operating in Parallel

- **Run Alongside Existing Programs**
With RPS & Solar Subsidies (ITC)
- **Don't Disrupt Existing Markets**
We Need All RE As Quick As Possible
- **Build Track Record**
- **Use Renewable Tariffs**
for Meeting RPS Targets

Paul Gipe, wind-works.org



Strategy--Hybrids

- **Domestic Content Requirement?**
Washington State
- **Distributed Generation Only?**
Voltage Caps?
- **Project Size Caps?**
20 MW (California)-50 MW (Spain)
- **Community Ownership**
Minnesota, New Brunswick



A photograph of a rural landscape featuring several white wind turbines. In the foreground, there is a lush green field. In the middle ground, a line of trees and a few small buildings, possibly a farm, are visible. The background shows a clear blue sky with some light clouds. The text is overlaid on the upper half of the image.

Move From A Culture of Consumption to A Culture of Conservation

--Ontario Premier Dalton McGuinty

Paul Gipe, wind-works.org

Montfort, Wisconsin

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 Nation of Consumers to A Nation of Producers

Paul Gipe, wind-works.org

Lackawanna, New York



**“Nothing is as powerful as an idea
whose time has come.”
-- Victor Hugo**

Paul Gipe, wind-works.org

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

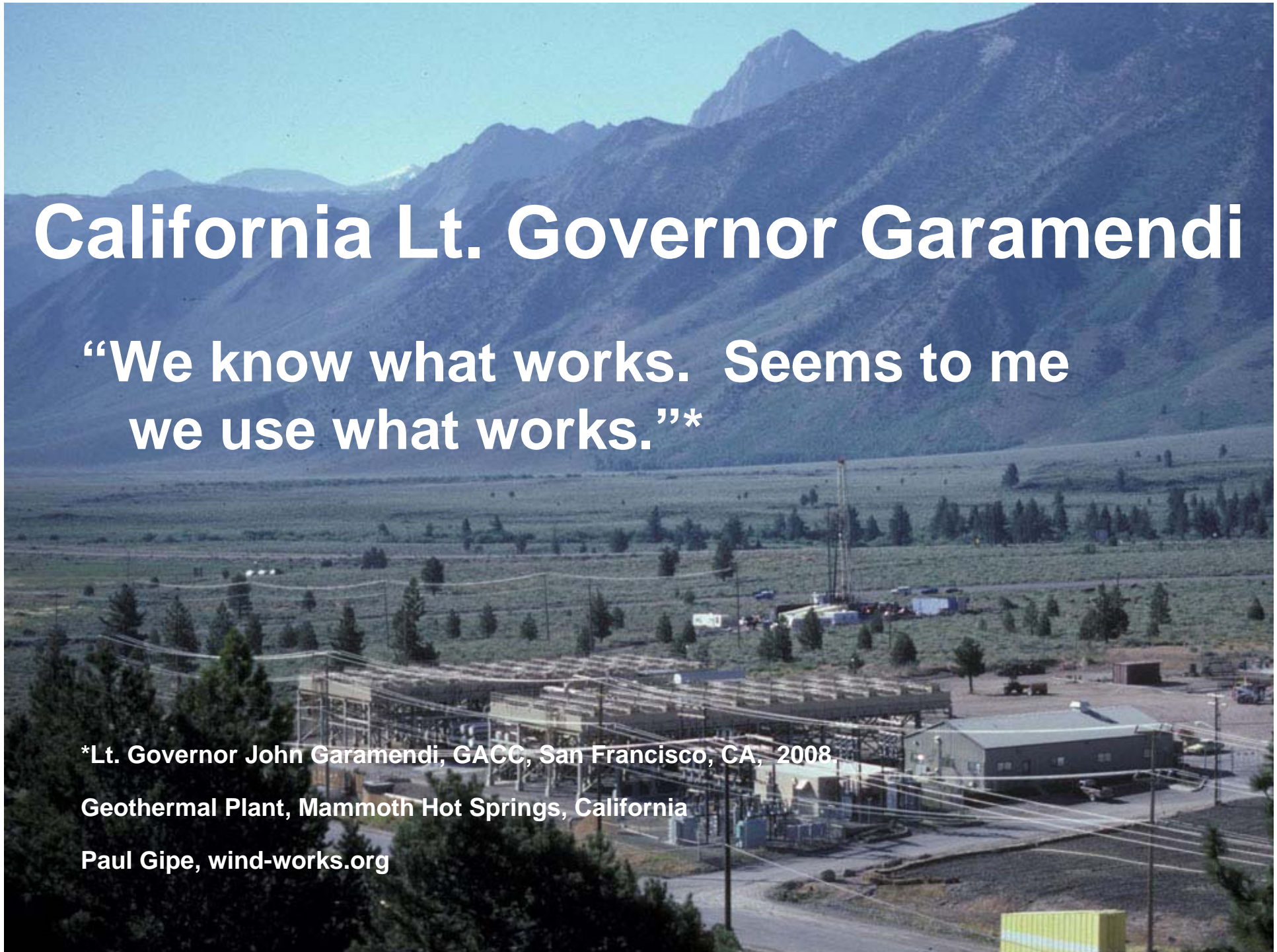
California Lt. Governor Garamendi

**“We know what works. Seems to me
we use what works.”***

***Lt. Governor John Garamendi, GACC, San Francisco, CA, 2008.**

Geothermal Plant, Mammoth Hot Springs, California

Paul Gipe, wind-works.org



Gaspé Peninsula, Quebec

No Time for Half-Measures

No Time to Lose

Paul Gipe, wind-works.org



Matane, Quebec

We Need A Lot More Wind . . .



Paul Gipe, wind-works.org

Hinesburg, Vermont

... And A Lot More Solar



Paul Gipe, wind-works.org

A Challenge Worthy of Great Nations

Paul Gipe, wind-works.org

Vestas V110, Denmark

Renewable Tariffs-- New Policy Option for North America

www.wind-works.org

Manawatu Gorge, New Zealand

