

# *“Next generation” green power products for corporate customers in North American markets*

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GREEN POWER MARKET DEVELOPMENT GROUP

# *The Green Power Market Development Group*

Developing corporate markets  
for 1,000 MW of new,  
cost-competitive green power  
by 2010 in the US



Alcoa Inc.  
Cargill Dow LLC  
Delphi Corporation  
The Dow Chemical Company  
DuPont  
FedEx Kinko's  
General Motors  
IBM  
Interface  
Johnson & Johnson  
Pitney Bowes  
Staples



# *Many current generation green power products are not sufficiently attractive to corporate customers*

## 1. High premiums

- Regulated markets: \$26 / MWh avg.
- Deregulated markets: \$21 / MWh avg.

## 2. Limited value proposition

- PR
- Environmental goals
- ???

*Value proposition often does not justify the premium*

*Less expensive means of PR & meeting environmental goals*



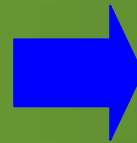
*“Next generation” green power product designs can address these shortcomings*

Green power using nationally sourced RECs



Reduces price premiums

Long-term fixed-price green power



Provides additional value proposition: Hedge

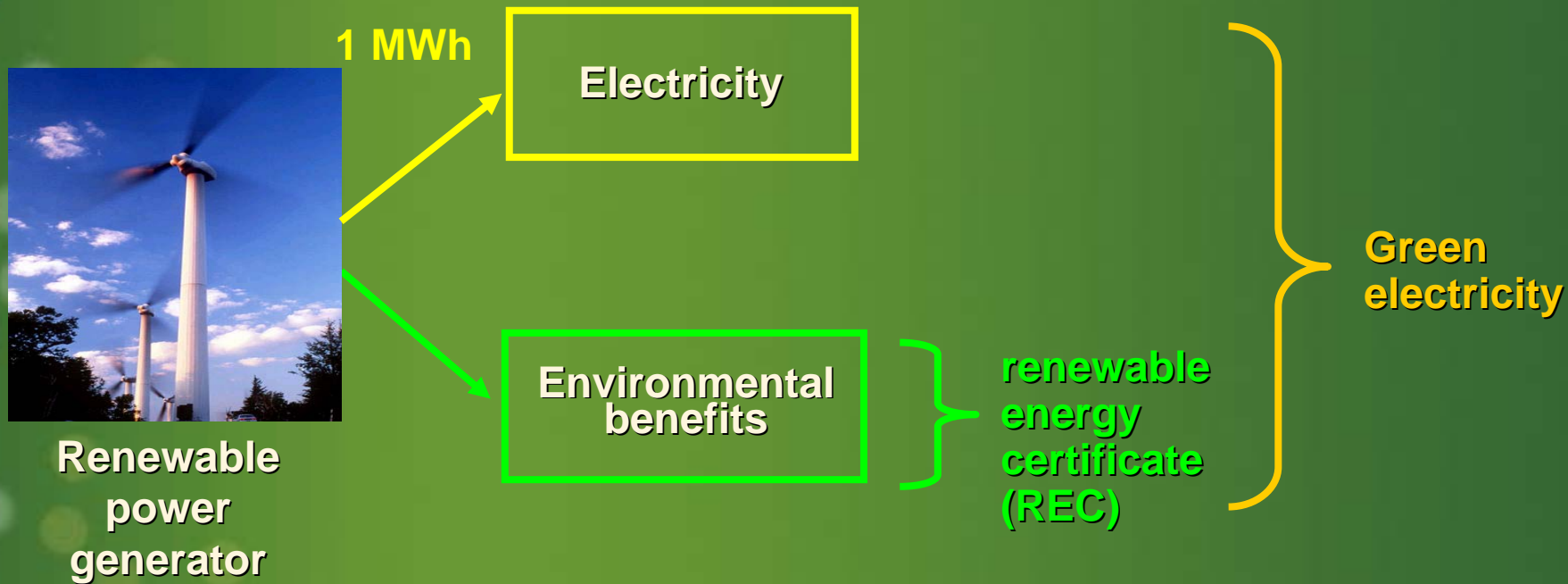
Green contract for differences



Provides additional value proposition: Hedge



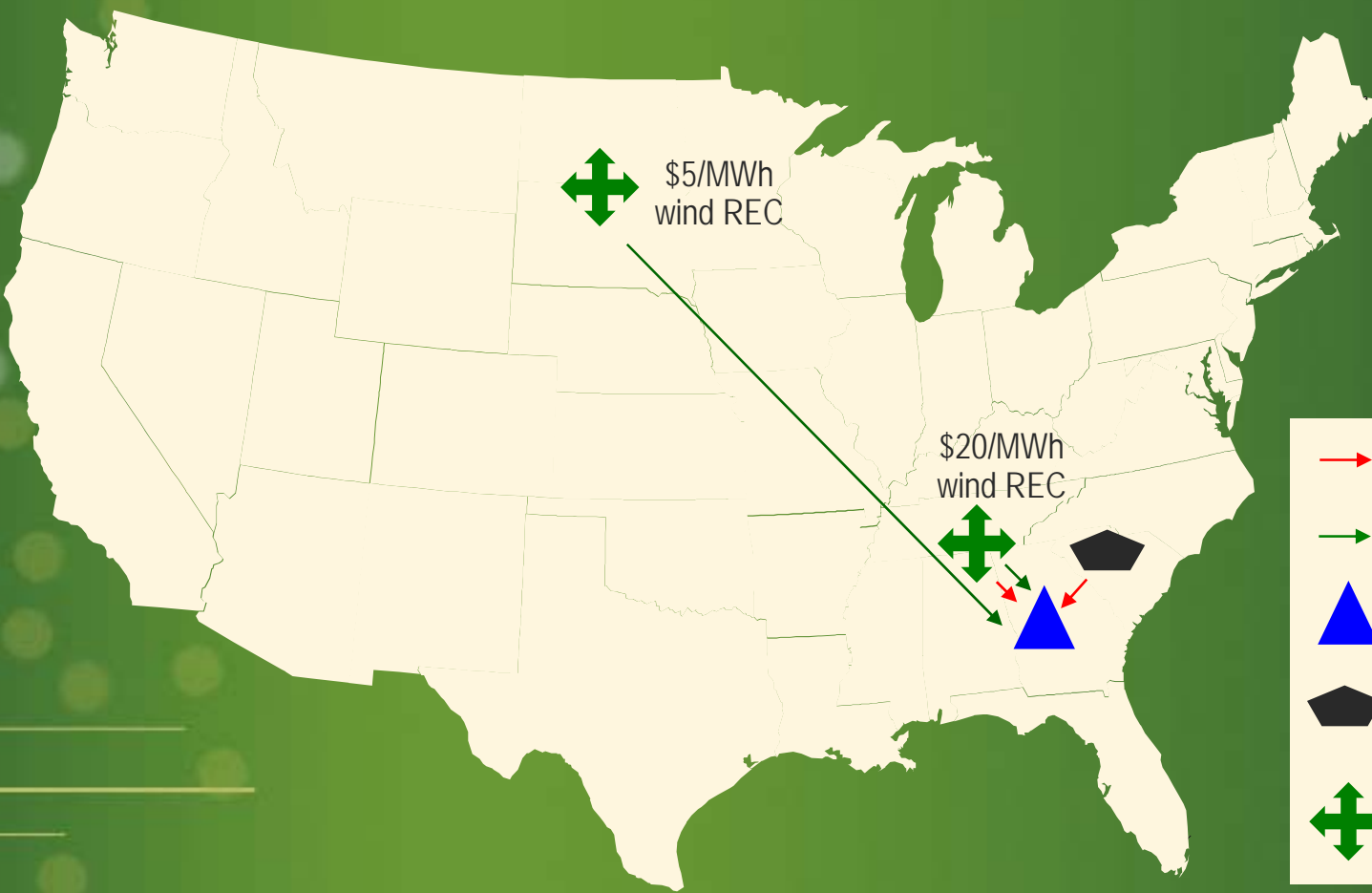
# *What is a renewable energy certificate (REC)?*



# What is green power using nationally sourced RECs?

Green power = Commodity electricity + REC

ILLUSTRATIVE



- Commodity electricity
- RECs
- ▲ Utility
- ▭ Conventional power plant
- ⊕ Wind farm



## *Emergence of green power using nationally sourced RECs could have several market implications*

For corporate customers



- Lower cost green power
- Greater variety of options

For retail electricity suppliers



- Diversified portfolio ("national" and "local" green power)



## *Green power using nationally sourced RECs help build green power markets in Canada*

Voluntary green power markets for corporate customers exist

Average premium of 4.1 cents/kWh (US)

Low penetration rate



Opportunity for green power using nationally sourced RECs (illustrative example)

- Company in Ontario wants wind power
- No local low cost option
- Utility sources wind RECs from Alberta and rebundles with local electricity





## *Several factors are in place making green power using nationally sourced RECs a viable opportunity in Canada*

- Regional differences in renewable resource abundance and cost
- Electricity providers familiar with wholesale REC markets
- Green power certification program already established
- "Competition" in electricity markets could make suppliers responsive



# Green power using nationally sourced RECs may be attractive in Mexico

DRAFT



Source: U.S. Department of Energy. 2001. *An Energy Overview of Mexico*. Available at: <http://www.fe.doe.gov/international/Western%20Hemisphere/mexiover.html>. U.S. Department of Energy.

## *What about "green power using NAFTA-sourced RECs"?*

### Illustrative examples

- Green power sold in US using wind RECs from Alberta
- Green power sold in Canada using geothermal RECs from Baja California

### Preconditions for market integrity

- Green power certification system in each country
- REC tracking system
  - Emerging
  - Meet minimum standards being developed by the N.A. Association of Issuing Bodies



## *What is long-term fixed-price green power?*

### Long-term

- 3+ years; often difficult for corporate customers to do >10 years

### Fixed price

- Flat rate

### Value proposition

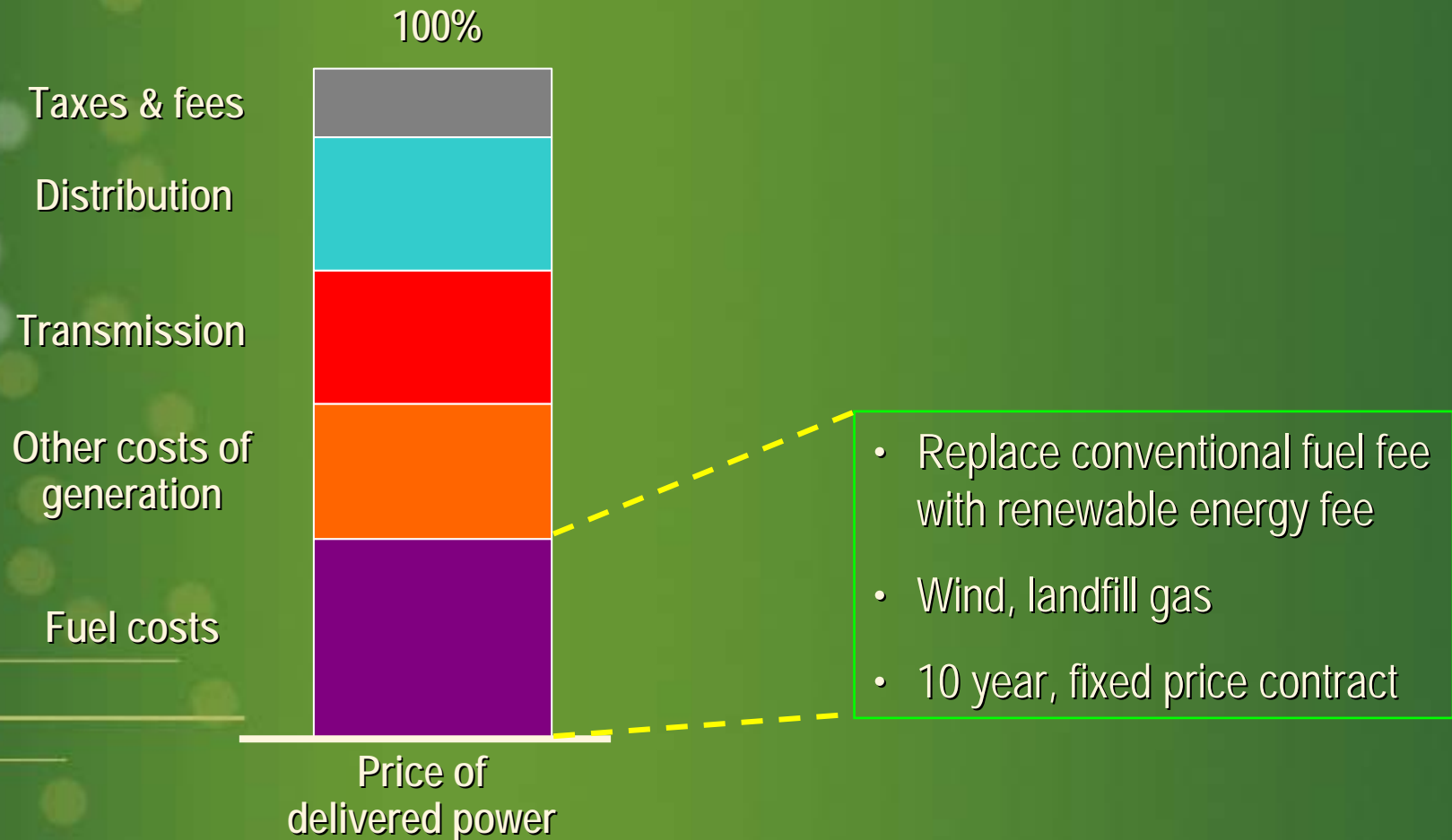
- PR, environmental goals . . .
- . . . plus hedge against electricity rate fluctuations

### Status

- Not common

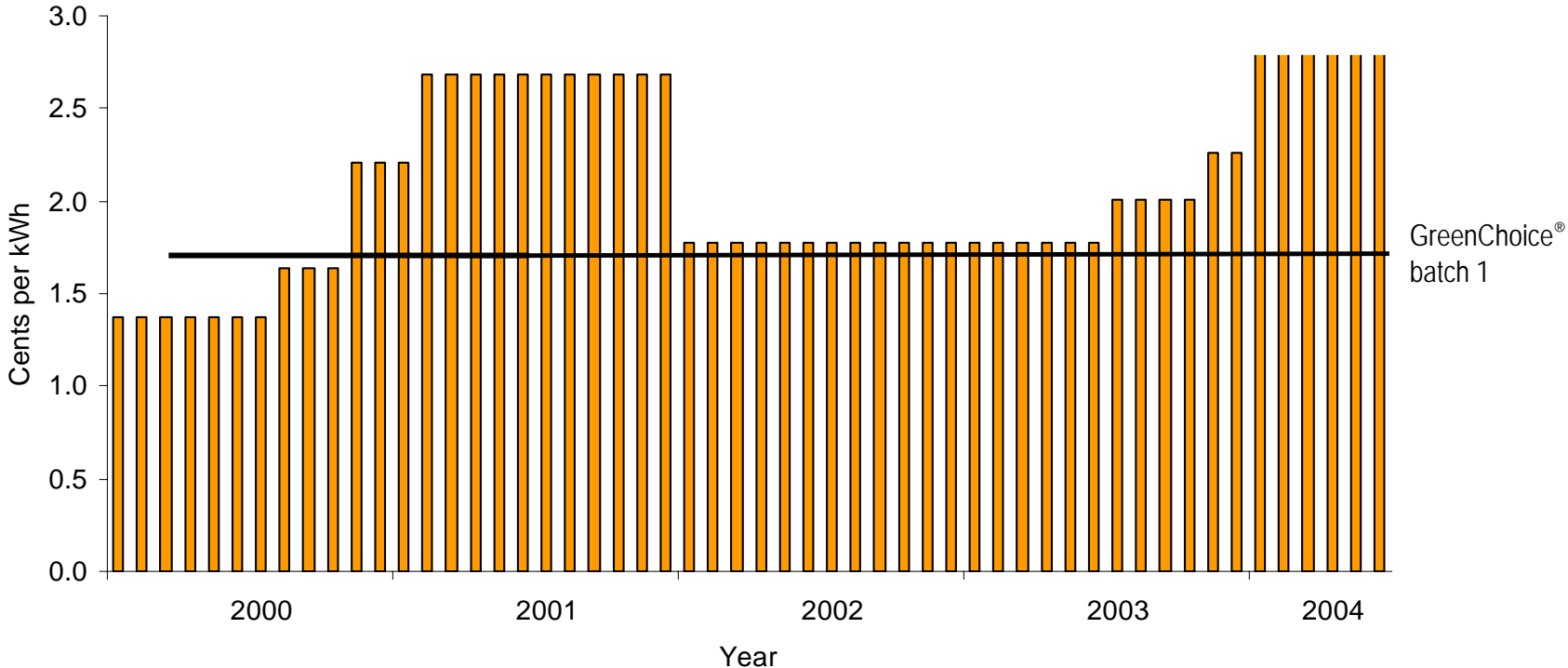


## Case example: Austin Energy (Texas)



# Case example: Austin Energy's fossil fuel charge vs. GreenChoice® charge

— Fossil fuel charge



Source: Austin Energy, 2004

# *Where would long-term fixed-price green power be attractive?*



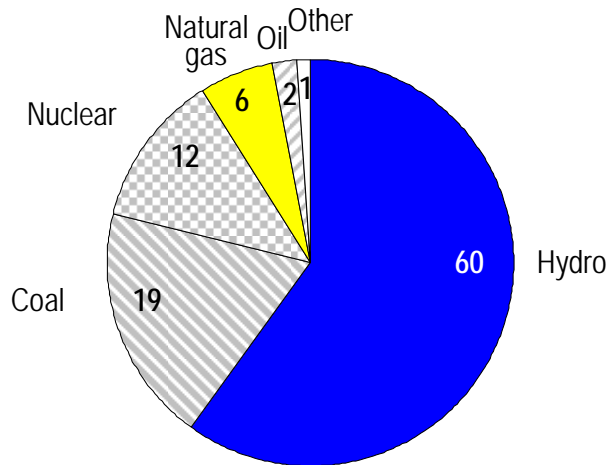
Markets where . . .

- Rates fluctuate & volatility passed on to customers
- Natural gas a key primary fuel
- Suppliers transitioning away from price caps

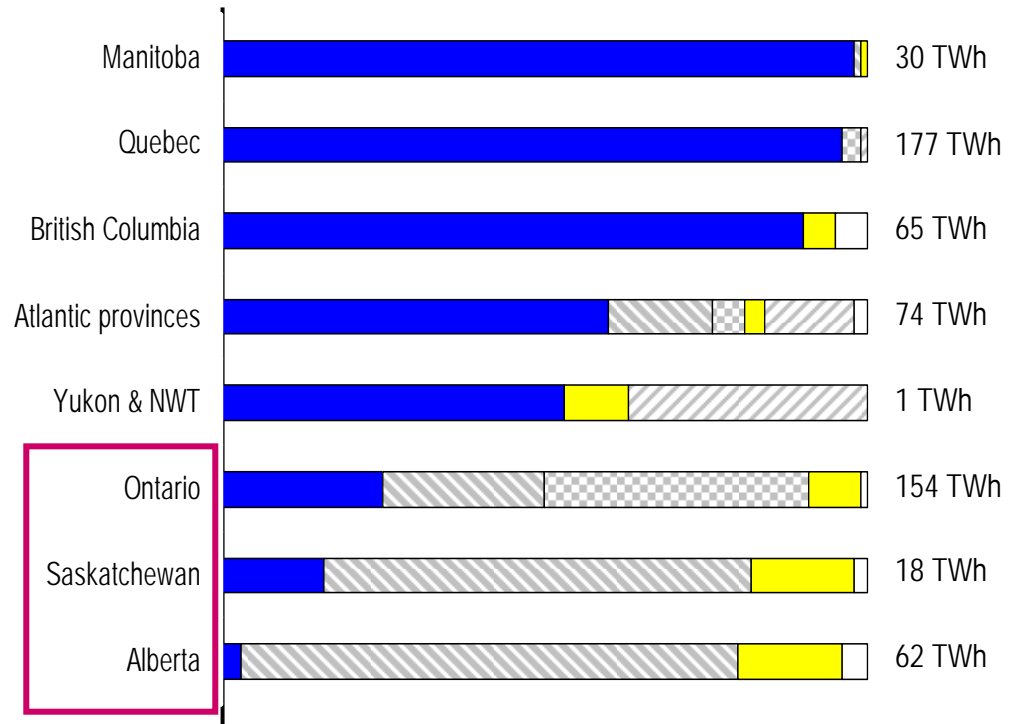


# Profile of Canadian electricity generation by fuel type

Net Canadian electricity generation – 2002  
 Percent, 100% = 581 TWh



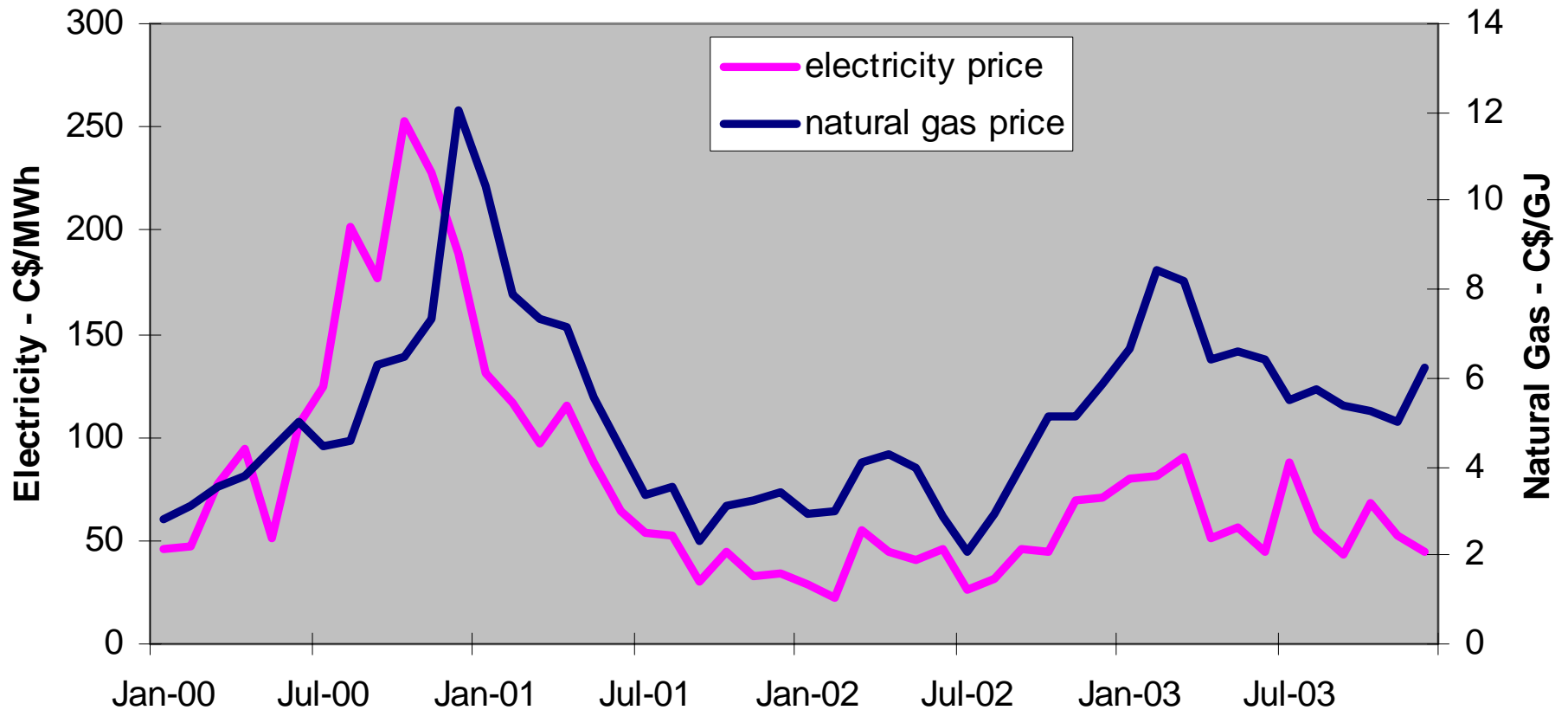
Net electricity generation by province/region – 2002  
 Percent, 100% = 581 TWh



Source: Statistics Canada. 2002. *Report on Energy Supply-Demand in Canada*.



# Historical electricity and natural gas prices in Alberta

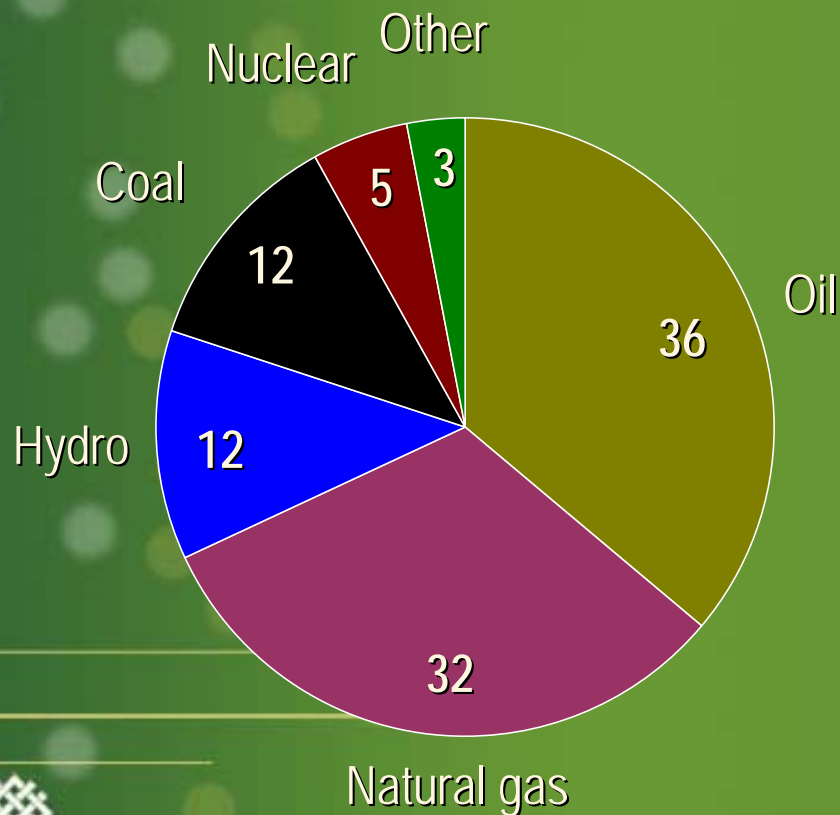


Sources: Albert Electric System Operator. Available at: <http://ets.powerpool.ab.ca>; Canadian Natural Gas Focus (2001, 2002, 2004).  
Simple monthly average NGX Intra-AB same day settlement price.

## What about Mexico? Some background facts . . .

Mexican net electricity generation – 2002

Percent, 100% = 215 TWh



- Tariffs adjusted monthly
  - Inflation, exchange rates
  - Fuel prices
- >70% of 2003–2012 planned capacity additions are NG
- ↑ in domestic NG demand > ↑ in domestic NG supply



# ***Impact of primary fuel price changes on electricity prices in Mexico***

<b>Primary fuel</b>	<b>Fuel price in 11/01 (USD/MMBtu)</b>	<b>Impact on high voltage tariff of doubling respective fuel price</b>	<b>Monthly fuel price volatility from 11/01 – 02/04</b>
Domestic fuel oil	\$2.69	16.9%	9%
Natural gas	\$3.00	11.9%	22%
Imported fuel oil	\$3.54	5.4%	11%
Domestic coal	\$2.12	3.7%	n/a
Imported coal	\$1.64	2.1%	5%
Industrial diesel	\$6.02	1.0%	8%

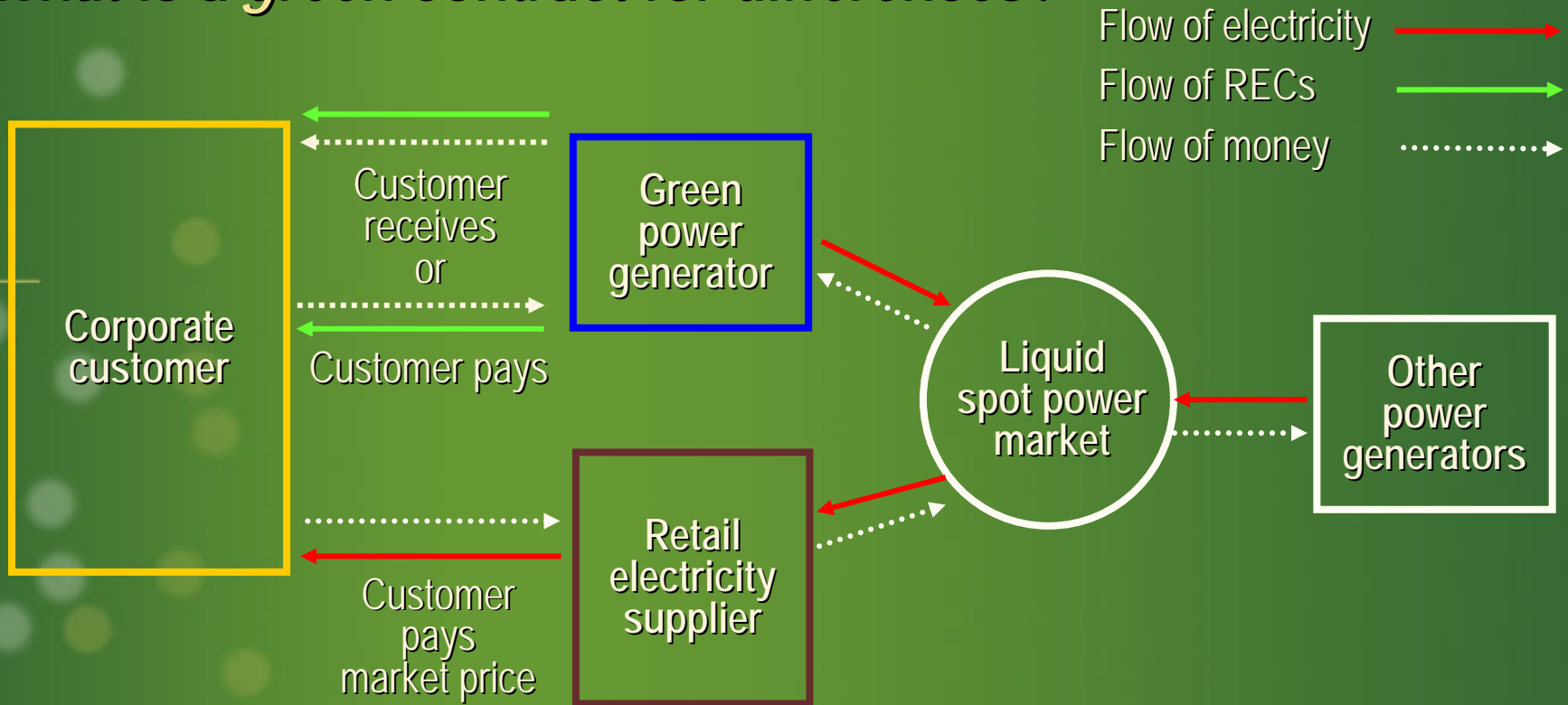
Source: Llamas, A., Federico Viramontes, Oliver Probst, Ruth Reyna, Anibal Morones, and Manuel Gonzalez. 2004. *The Mexican Power Sector and Dependence on Natural Gas*. Monterrey Institute of Technology.

## *Long-term fixed-price green power could be an attractive electricity product in Mexico*

- Increasing risk of escalating electricity rates
- Corporate need for hedge
- Mexico has attractive renewable resources
  - Wind & geothermal
  - Zero fuel costs
  - Amenable to long-term contracts
- Long-term fixed-price contracts possible in regulated market



# What is a green contract for differences?



CFD with green power generator signed at...	& market price for power is...	\$ customer receives from (pays to) green power generator is...	& net cost to customer is:
\$40/MWh	\$55/MWh	\$15/MWh	\$40/MWh
\$40/MWh	\$30/MWh	(\$10/MWh)	\$40/MWh



## *Canada is taking the lead in implementing green CFDs*

### VisionQuest + Enmax + City of Calgary

- 26,000 MWh/year
- 10 year contract
- Based on wind power
- Indexed to Alberta power pool

### VisionQuest + Enmax + Province of Alberta

- 105,000 MWh/year
- 10 year contract
- Based on wind power
- Indexed to Alberta power pool



*More information about next generation products can be found in the next issue of WRI's "Corporate Guide to Green Power Markets"*



- November, 2004
- 3 products
- Case studies
- US, Canadian, & Mexican markets



*Thank you!*

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