



## Harnessing the “Clean-Tech” Wave – Building the Renewable Energy Market in North America

A Presentation to a CEC forum

**October 28, 2004**  
**Montreal, Canada**

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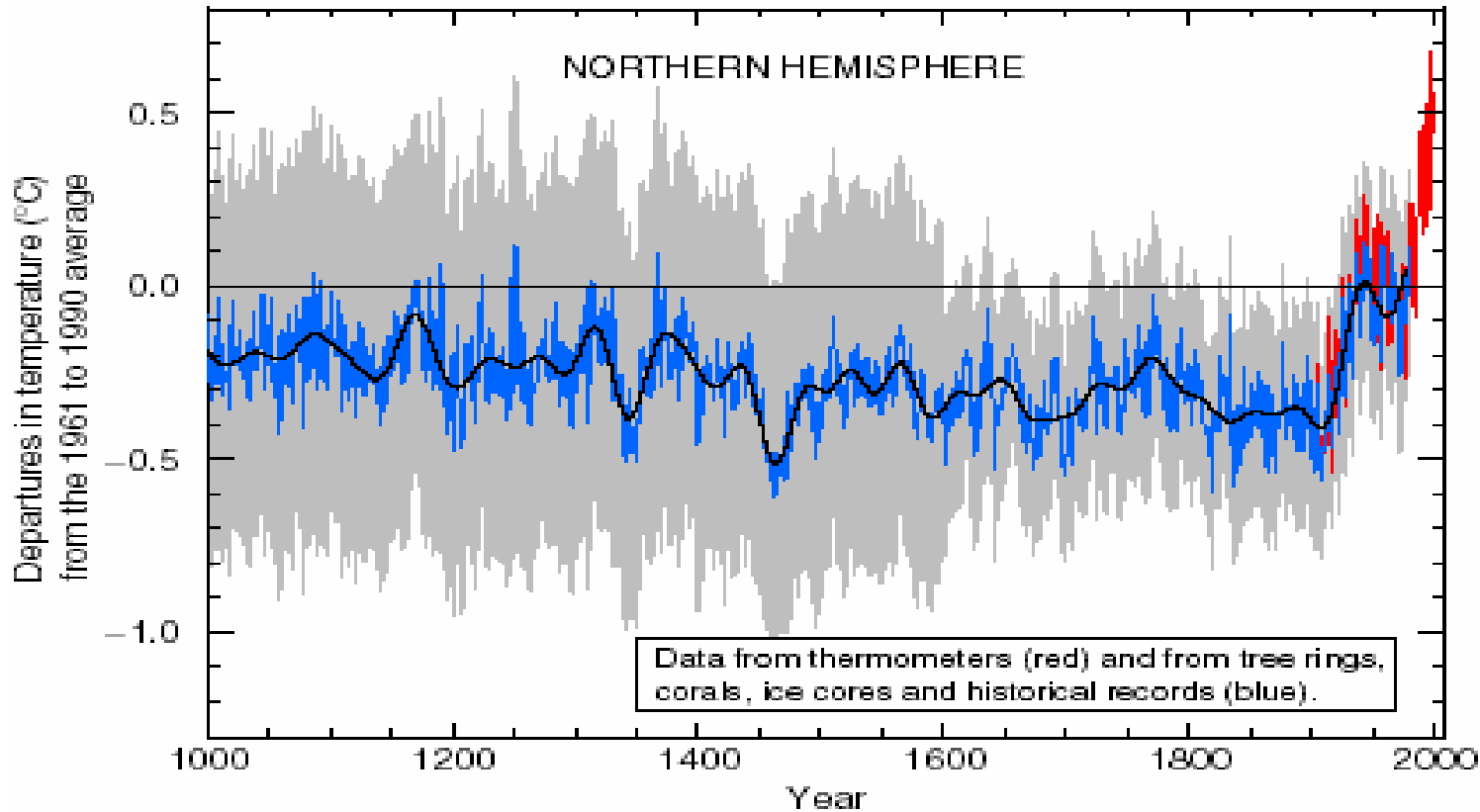
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- **Increasing public policy support – regulated emissions limits; AND renewables targets/commitments; emission trading schemes**
- **Stronger financial and strategic backing from multinationals – eg. Honda, Toyota, BP, Shell, NTT DoCoMo, Anglo American, FedEx, UPS**
- **Growing energy market dislocations – deregulation, increased price volatility, grid failures**
- **Increasing NGO pressure – better disclosure, more resources and credibility, and instantaneous global communications capability**
- **Technological/cost breakthroughs**
- **Iraq/Middle East energy politics**
- **Recent Russian signals on Kyoto**
- **European Investment Bank: 50% renewables target for all power lending by 2010**
- **China: to triple power generation by 2015 - \$450 billion to be invested in transmission efficiencies, off-grid solutions, 10% renewables target by 2010**
- **Growing private equity allocations by pension funds to enhance returns and redress recent losses**
- **Growing institutional shareholder activism on climate change – eg. CDP, INCR, U.S. stakeholder resolutions**

(b) the past 1,000 years

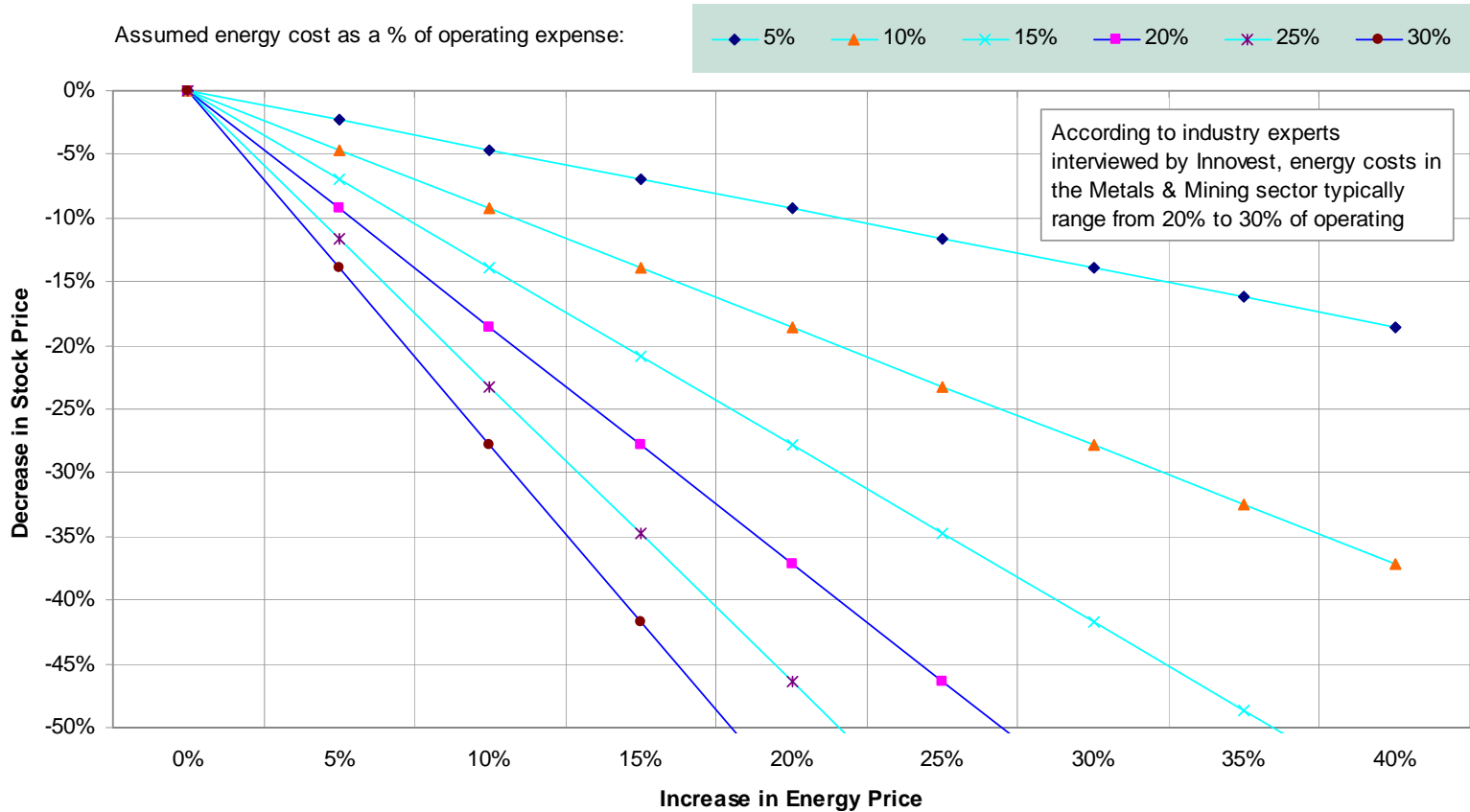


Global mean surface temperature increased by 0.6°C over the 20<sup>th</sup> Century

Source: Intergovernmental Panel on Climate Change

Sector	Company “Carbon Beta” Evaluation
<p>Auto M’frs</p> 	<p>FT500 auto manufacturers vary by a factor of <b>35x</b> in terms of CO2 emissions per vehicle sold/produced</p>
<p>Oil &amp; Gas</p> 	<p>Costs to cut GHG emissions by 10% below 2001 levels as pc of annual cash flow range from <b>2.5% to 0.4%</b> (assuming \$20 per tonne CO2e)</p>
<p>Electric Utilities</p> 	<ul style="list-style-type: none"> <li>• Reduction by 10% in GHG emissions intensity ranges from <b>\$0.2 to over \$1.7</b> per MWh</li> <li>• EU utilities: emissions reduction cost burden could be between <b>2.7% and 19.5%</b> of net income</li> </ul>
<p>Metals &amp; Mining</p> 	<ul style="list-style-type: none"> <li>• Total annual costs for 5 major FT500 M&amp;M firms to cut 2001 CO2 emissions by 10% over 5 yrs assuming uniform abatement costs are <b>\$67m</b></li> <li>• For the firms, this ranges from 0.3% to 1.5% of annual net income</li> </ul>

**Effect of increase in energy cost on stock price  
at various assumed levels of energy cost as a % of operating expense  
Metals and Mining Sector**



Source: Innovest Strategic Value Advisors

## So Where Are the Opportunities for Investors?

- **Exploit huge information inefficiencies in the market – eg. CDP findings re: radically different awareness levels – same sectors? Same solar system?**
- **Backing “winners” in the large cap space**
- **Emissions trading – EU, UK, CCX, Regional U.S. Markets**
- **Renewables and Clean Technology: \$2 trillion global market by 2020 (World Energy Council); Renewables will represent 15% of total OECD power generation by 2020 (Royal Dutch/Shell)**

## **Governments Taxing Carbon**

- **U.K.**
- **Netherlands**
- **Sweden**
- **Finland**
- **Japan**

## **Governments buying carbon credits:**

- **Netherlands**
- **Japan**
- **Canada**
- **Sweden**
- **Finland**

## Renewable Investing is Accelerating . . .

### Equity Funds – A Few Examples . . .

- Rabobank CDM Fund €40 m
- CDC IXIS Renewables €45 m
- Dexia Energy Efficiency €20 m
- World Bank PCF \$180 m
- IFC CDM Fund \$40 m
- World Bank Bio Carbon Fund \$10 m

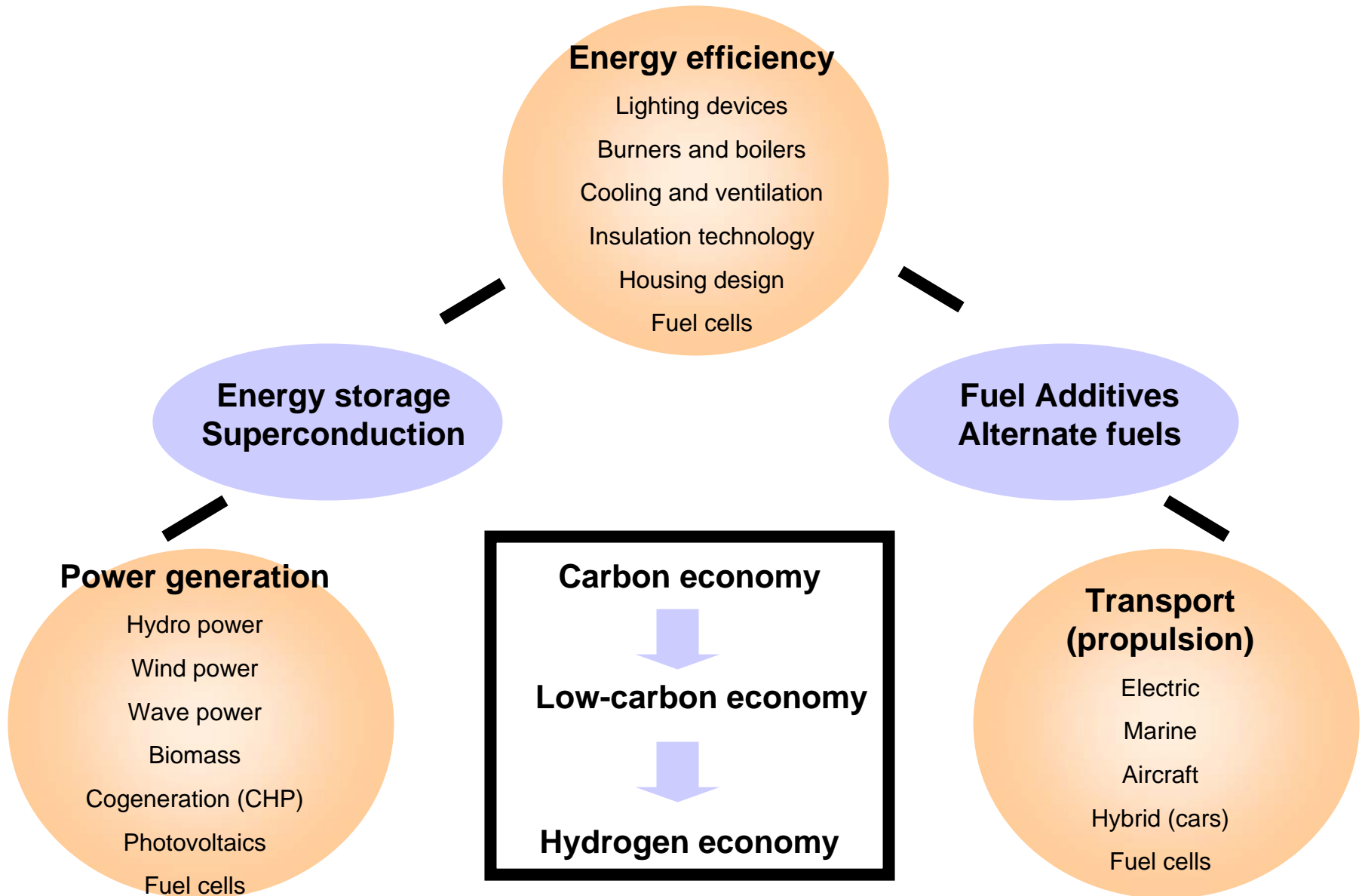
**But, WHAT ABOUT NORTH AMERICA?**



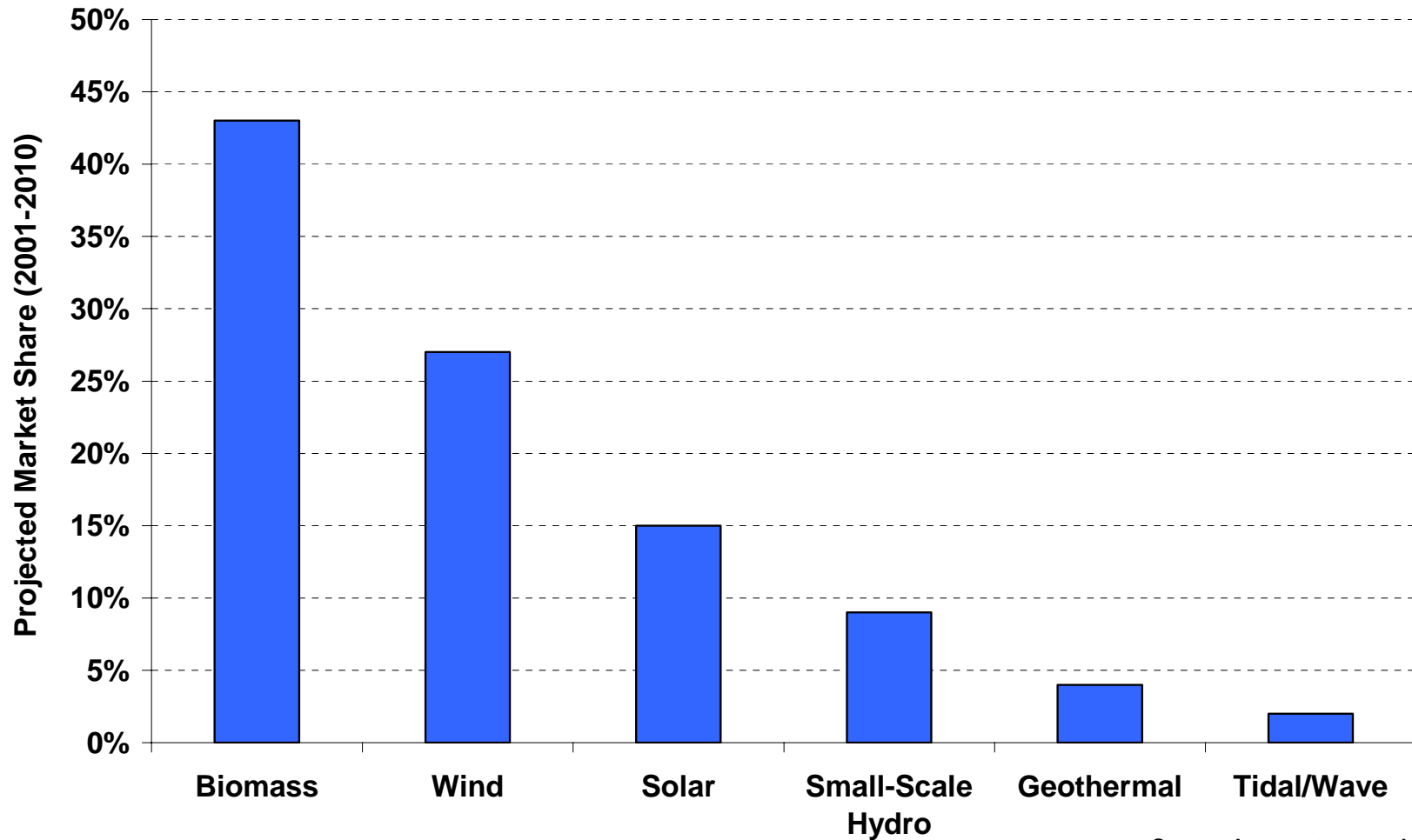
# Demand Drivers: Multinational Companies



Company	Energy Tech Focus	Company	Energy Tech Focus
<b>BP, Shell, TFE, ENI, Suncor</b>	<i>Wind, solar, biomass, H fuel cell</i>	<b>ABB</b>	<i>Electricity generation and transmission</i>
<b>Exxon, ChevronTex.</b>	<i>ULEVs, hybrid engines, energy efficiency</i>	<b>GE, Siemens, Rolls Royce</b>	<i>Wind, advanced turbines, fuel/energy efficiency</i>
<b>Dow, Air Products, BASF</b>	<i>Fuel cells, advanced materials, CHP/cogen, DG</i>	<b>AEP, FP&amp;L, Duke, TransAlta, Iberdrola, Keyspan</b>	<i>Clean coal, wind, DG, biomass, power generation</i>
<b>Honda, Toyota, DC, GM, Ford, Nissan</b>	<i>Vehicle fuel cells</i>	<b>Intel, Applied Materials, Kyocera</b>	<i>Advanced materials, power quality, solar</i>
<b>Diageo, J. Sainsbury</b>	<i>Fuel efficiency, renewable fuels, DG</i>	<b>Indetex</b>	<i>Wind, solar, power quality, DG</i>
<b>FedEx, Purolator, UPS</b>	<i>Diesel hybrids, hydrogen fuel cells</i>	<b>Boeing, Raytheon</b>	<i>Fuel cells, micropower</i>
<b>NTT DoCoMo, Telekom, BT</b>	<i>Micropower, power quality and advanced fuel cells, energy mgnt</i>	<b>United Technologies</b>	<i>Fuel cells, power quality, energy efficiency</i>
<b>Alcan, Alcoa, Anglo American</b>	<i>Fuel cells, catalysts, energy efficiency</i>	<b>Trizec Hahn, Arden Realty, Fannie Mae</b>	<i>Applied microturbines and building energy efficiency</i>
<b>HP</b>	<i>Fuel cells, energy efficiency</i>	<b>Eastman</b>	<i>Biocatalysts, industrial efficiency</i>

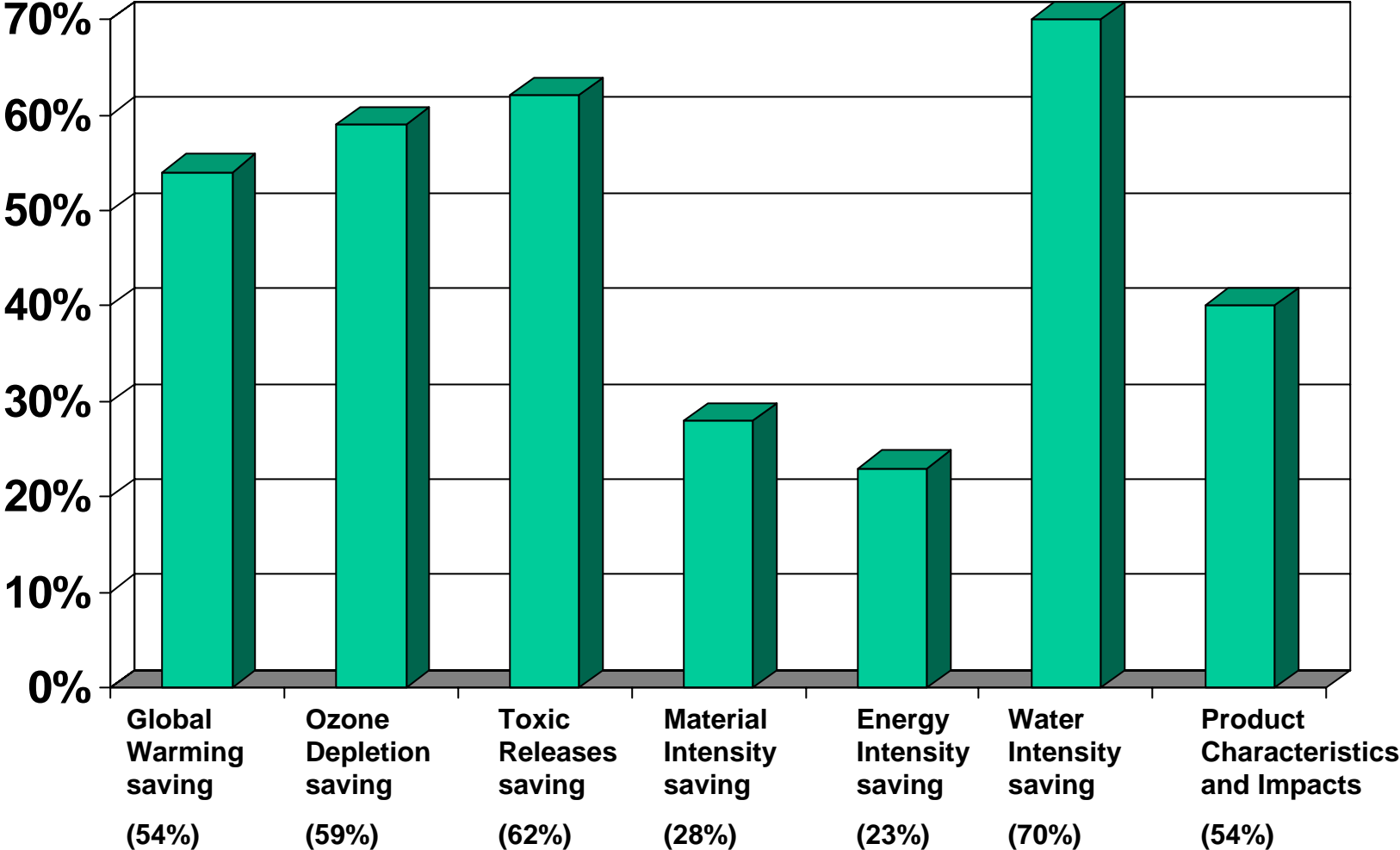


Estimated Share of \$270 billion Renewable Energy Market (2001-2010) by Technology



Source: Innovest research

# Calculating an “Environmental Dividend”\*



\*Source: Storebrand Investments

**“The Stone Age came to an end not for lack of stones,  
and the oil age will end, but not for lack of oil.”**

**Sheik Ahmed Yamani**

***Chairman, Center for Global Energy Studies***

***Former Minister for Petroleum and Mineral Resources,***

***Saudi Arabia***