

# An Ocean Energy Research Consortium?

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**DALHOUSIE  
UNIVERSITY**

*Inspiring Minds*

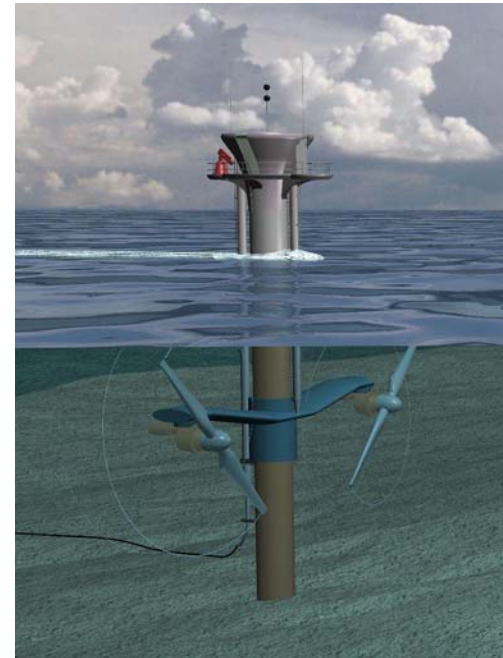
# An Ocean Energy Research Consortium

- Need
- Potential
- Tools
- Materials
- Product
- Discussion



# Is There a Need?

- Renewable energy interest in Atlantic Canada
- EPRI Tidal Study
- Region's Energy Situation
  - ▶ Energy Security
  - ▶ Reduce Fossil Fuel Reliance
  - ▶ Lower GHG Emissions
  - ▶ Price Security



# The Potential

- Annapolis Royal tidal barrage operating for 20 years
- Wind energy is being developed
- Wave energy shows potential
- Bay of Fundy in stream tidal resource is world class!



# Tidal In-stream Power at EPRI Study Sites

	AK	WA	CA	MA	ME	NB	NS
<b>Cross-section Area (m<sup>2</sup>)</b>	72,500	62,600	74,700	17,500	36,000	60,000	225,000
<b>Power Density - Depth Averaged (kW/m<sup>2</sup>)</b>	1.6	1.7	3.2	0.95	2.9	0.7 - 2	4.5
<b>Avg Annual Power Available (MW)</b>	116	106	237	13.3	104	43 - 100	1,013
<b>Avg Annual Power Extractable (15%) (MW)</b>	17.4	16	35.5	2.0	15.6	6.5 - 15	152
<b>No of Homes Powered (1.3 kW/Avg home &amp; 90% power train efficiency)</b>	12,000	11,100	27,300	1,500	12,000	4,500 - 12,000	117,000

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# The Tools to Assemble the Consortium

- Energy at Dalhousie
- EnergyINet – the Energy Innovation Network
- OREG – the Ocean Renewable Energy Group

# Energy at Dalhousie

- Energy at Dalhousie coordinates and maximizes opportunities for energy related research and education
- We embrace all forms and aspects of energy
- We stress an inter-disciplinary approach to research, education, and external collaboration
- We represent a virtual centre for energy research and education
- Energy at Dalhousie encourages academic collaboration and external partnering with industry and governments

# Energy at Dalhousie

- Our mission: to conduct inter-disciplinary research into conventional and alternative energy sources and their impact on the economy, environment, and society.
- Our vision: to be a leading academic institution for energy sector research and education working in collaboration with industry, government, and institutional partners in Nova Scotia, the Atlantic region, and beyond.

# Strategic Objectives

- Ensure communication and coordination of research across the Dalhousie energy community
- Establish relationships and develop strategic alliances with corporations, government agencies, and other academic institutions in the energy sector
- Facilitate inter-disciplinary, collaborative research programs
- Coordinate strategic requests for infrastructure and research capacity
- Advance education and co-op opportunities at the undergraduate and graduate level

# Energy at Dalhousie Workshop Sessions

## 1. Overview Session

In January, 2005 - a briefing session that provided an overview of the rationale for this initiative and the work completed thus far. Most importantly, we wanted to explore the opportunities and potentials of well-functioning research networks.

## 2. Focus Group Sessions

In February - a series of focus group meetings with smaller groups of researchers to discuss specific research capabilities, interests and implications for strengthening the research networks.

## 3. Wrap Up Session

In March – a final session to summarize the feedback and ideas and to propose a strategic plan.

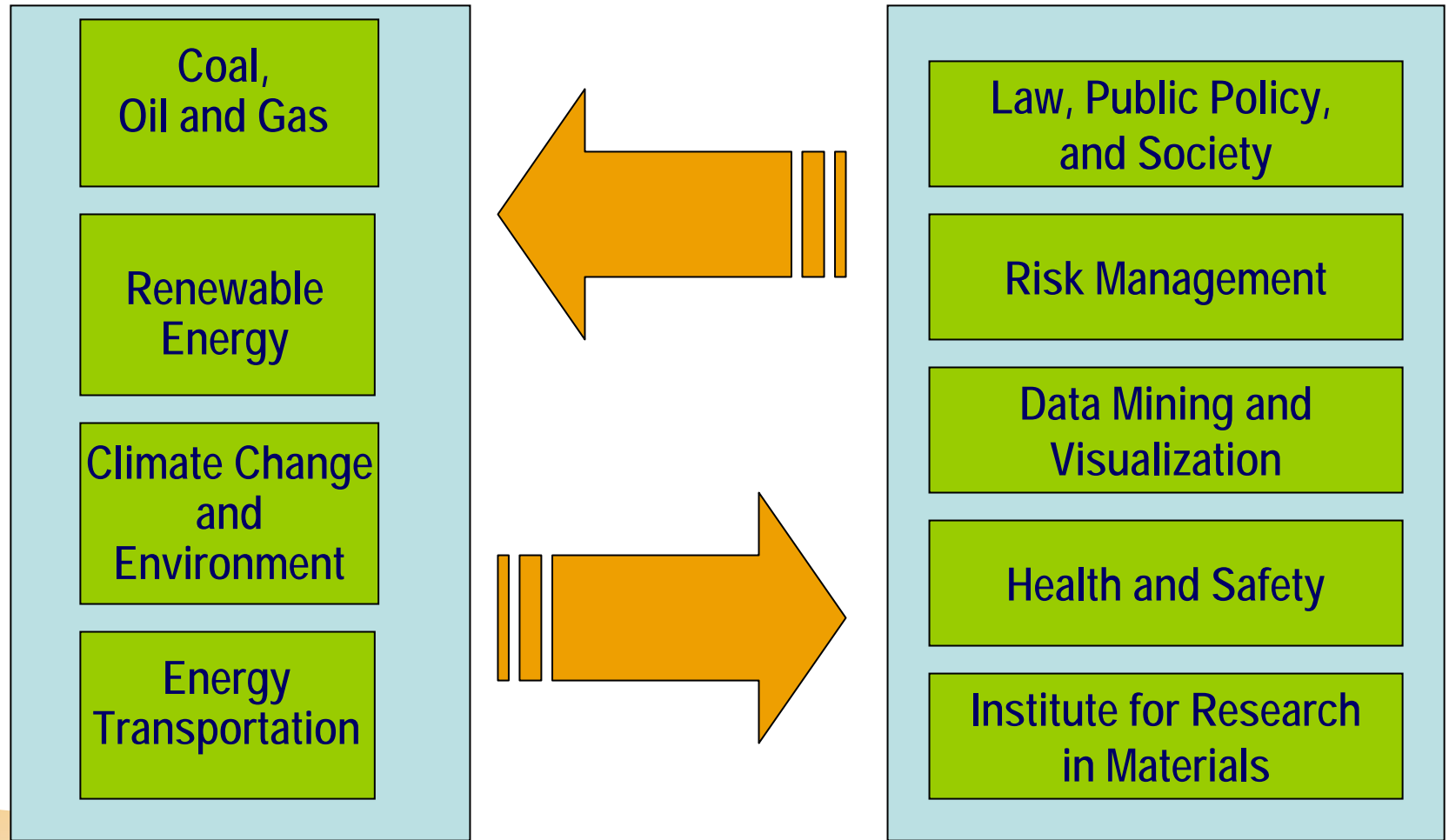
# Focus Group Objectives

To determine:

- The research interests of the network
- The research capability of the network
- The research focus of the network
- The network's academic, industry and government relationships
- What is required for the network to function successfully
- How will the network achieve success

# Research Networks

# Research Resources



# Energy at Dalhousie – present status

## ● Growing networks of energy excellence

- ▶ Developing focused R&D networks in ocean energy, bioenergy, small wind technology, petroleum engineering, offshore petroleum geoscience, and geophysical data interpretation and modeling.

## ● Research topics being developed:

- ▶ Greenhouse gas mitigation
- ▶ Enhanced coal bed methane production
- ▶ Bio energy through digestion and gasification
- ▶ Secure, distributed visualization technologies
- ▶ Tidal In-stream energy conversion



# EnergyINet

Unlocking Tomorrow's Energy

# EnergyINet

- A neutral organization – not government, industry, or academia - that seeks to advance areas of strategic importance to Canada
- A collaborative innovation network that promotes an integrated energy strategy
- A catalyst to bring groups together to:
  - ▶ Link and leverage existing research and innovation efforts
  - ▶ Unlock the next generation of ideas and technology
  - ▶ Provide a long-term, abundant supply of environmentally responsible energy

# Energy Innovation Network

## ● Vision

- ▶ An abundant supply of environmentally responsible energy, creating economic prosperity and social well-being for all Canadians

## ● Key Operating Principles

- ▶ Integration: opportunities emerge when energy sector is viewed as an interconnected whole: eg using the CO<sub>2</sub> from clean coal technologies to enhance the production of aging oil fields and ultimately storing the CO<sub>2</sub> to reduce GHG emissions.
- ▶ Collaboration: achieving shared goals - avoiding fragmentation

# EnergyNet Focus

## ● Innovation Programs

- ▶ Alternative and Renewable Energy
- ▶ Water Management
- ▶ Clean Coal/Carbon
- ▶ CO<sub>2</sub> Management
- ▶ Oil Sands Upgrading
- ▶ Improved Recovery
- ▶ Energy Efficiency

## ● Cross-Cutting Initiatives

- ▶ Capacity building
- ▶ Global Intelligence
- ▶ Strategic Communications
- ▶ Technology Commercialization

# Taking on These Challenges

- To overcome shared challenges, we need a new approach to unlock tomorrow's energy
  - ▶ Collaboration
  - ▶ Innovation
  - ▶ Long-term investment
  - ▶ Integrated energy approach
- Involves bringing people and resources together
  - ▶ Expertise, vision, priorities and funding

# Materials to Build With

- Governments – Federal, Provincial, and Municipal
  - ▶ Technical knowledge and guidance, funding, policy and regulatory delivery, incentives, facilitation
- Industry Stakeholders
  - ▶ Power producers, system operators, developers, manufacturers, suppliers
- Research community
  - ▶ Universities, community colleges, research councils, oceanographic institutes, consultants

# The Product

- An inter-disciplinary ocean renewable energy research and development consortium
  - ▶ Consortium members from industry, government, and academia
  - ▶ Multiple sources of funding
  - ▶ To conduct research and provide advice on issues associated with ocean energy development - social, regulatory, environmental, and economic.
  - ▶ To develop or refine the science and engineering of tidal technologies
  - ▶ Assess environmental and social impacts of marine energy development

# Conclusions

- An ocean energy research consortium is needed
- Governments, industry, and academia are interested
- We have the tools
- I put the question the the room:

**What will the consortium look like?**

**How do we move it forward ?**

- Questions – Discussion?