Fundy Tidal Energy Governance: The Role of SEAs

Meinhard Doelle

Marine & Environmental Law Institute
Dalhousie University
Halifax, NS

Bay of Fundy Tides

- 290 km long/100 km at the mouth
- “One huge estuary”
- 16 metre tidal range in Cobequid Bay
- High tides caused by shape of the Bay, and Seiche (“bathtub”) effect
- 100 billion tonnes of water in and out every day

Bay of Fundy Currents

- Current velocity affected by shape and position
- In Cobequid Bay reaches >6m/sec^{-1}
- The stronger the currents, the higher the sediment carrying capacity

Bay of Fundy Ice

- Ice, on the surface and below
- “Dirty” cake ice

Bay of Fundy Fishery

- Outer Bay: herring, cod, haddock, lobster, scallops
- Inner bay: herring, flounder, shad dogfish, lobster and clams
- Also sea urchin, marine worms and seaweed
- Landed value > $105 million per year

Brief Chronology of Tidal In NS

- **Tidal Barrage Project in Annapolis Royal in 1980-82**
- **Tidal SEA in 2007-2008**
- **Open Hydro pilot in 2009 (1 small turbine, destroyed)**
- **Tidal SEA update in 2013-14**
- **Open Hydro 2nd pilot in 2015 (2 larger turbines)**
- **Black Rock Tidal pilot in 2015 (16 small turbines)**
- **Atlantis Resources Corporation 2017 (1 large turbine)**
- **Minas Energy 2017 (1 large turbine)**
- **Small scale tidal at Digby Neck ?**

Jurisdiction over Tidal

- **Federal Areas of Jurisdiction**
  - Fisheries
  - Navigation
  - Marine Pollution
  - Territorial (beyond the province?)

- **Provincial Areas of Jurisdiction**
  - Property and civil rights
  - Matters of a local nature
  - Energy production

Key Legislation

Federal Acts

- CEAA (2012)
  - Covers projects > 5 MW
- Fisheries Act
  - Serious harm to fish
  - Pollution
- SARA
  - Salmon, whales, …
- Navigation Protection Act (2010)
  - Now limited to navigation
- NEB Act
  - Generation beyond province, inter-jurisdictional transmission

Key Legislation

Provincial Acts

- NSEA
  - EA's, Approvals
- Fisheries & Coastal Resources Act
  - Conflict with aquaculture?
- Endangered Species Act
  - Piping plover
- Energy Resources Conservation Act
- Electricity Act
  - New (next slide)
- Public Utilities Act
- EGSPA

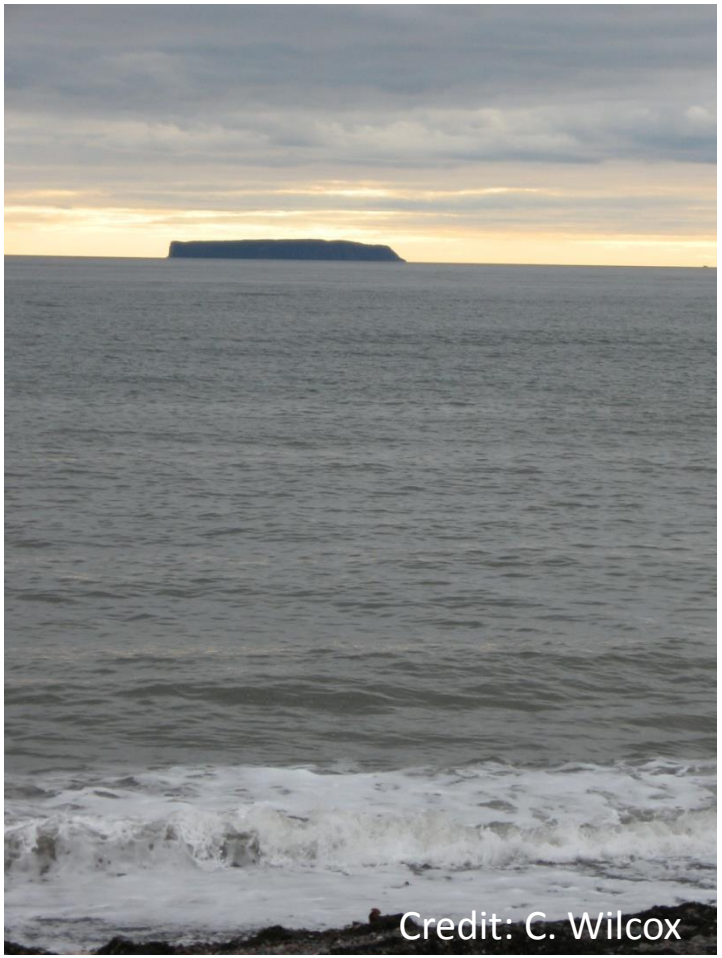
Electricity Act (post SEA)

- **RPS (2015: 25%, 2020: 40%)**
- **Developmental Tidal > .5 MW**
  - **Developmental Tariff**
  - **Test Tariff (Phase I and II)**
- **Community Tidal**
  - **ComFIT Tariff**
- **Open Access Transmission Tariff**
- **Producer can sell directly to user**

The Fundy Tidal Energy Ad-hoc SEA (2007)

Asked to address:

- Whether tidal energy should be developed
- Alternative ways it could be developed
- Potential interactions with the biophysical and socio-economic environment
- Information gaps that need to be filled.



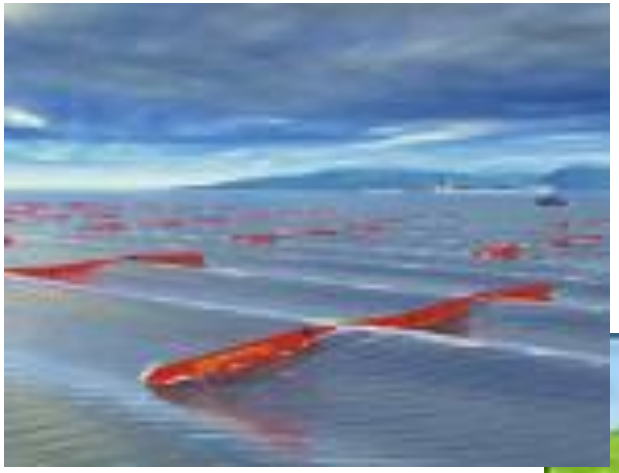
The Basics

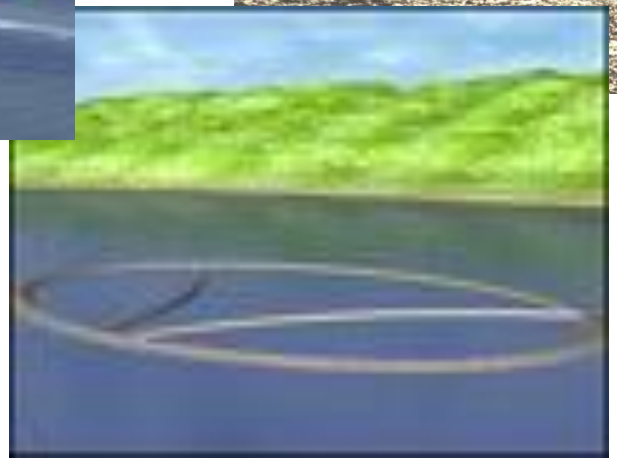
- No legal requirement or legislative basis
- Commissioned by NS Dept. of Energy ($250,000)
- Carried out by Offshore Energy Environmental Research (OEER) Association – a research partnership of NS government & three NS universities
- Time frame April 07 to May 08
- "inform decisions on whether, where, when and under what conditions to allow pilots and commercial projects into the water .....and under what conditions renewable energy developments in the Bay of Fundy are in the public interest over the long term"
- In collaboration with New Brunswick ($60,000)

Overview of all marine renewables....

Offshore Wind

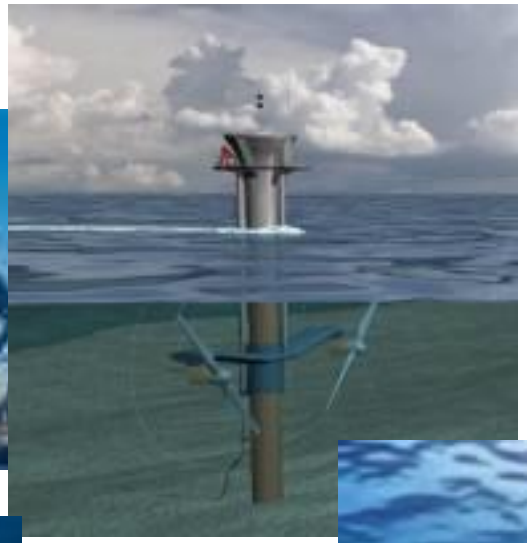
Wave energy

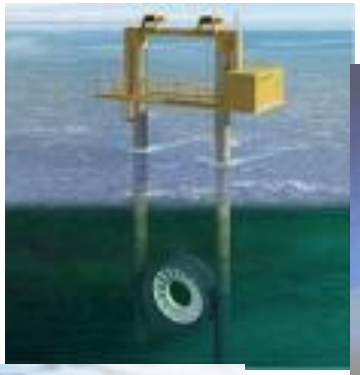


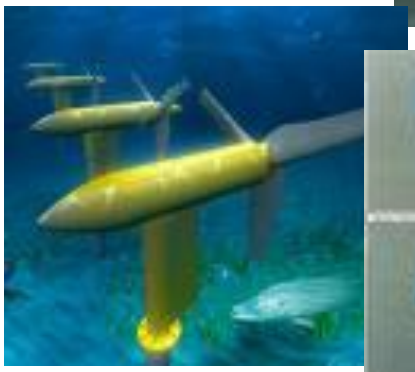


Other tidal (lagoon)

... but focus on in-stream tidal turbines







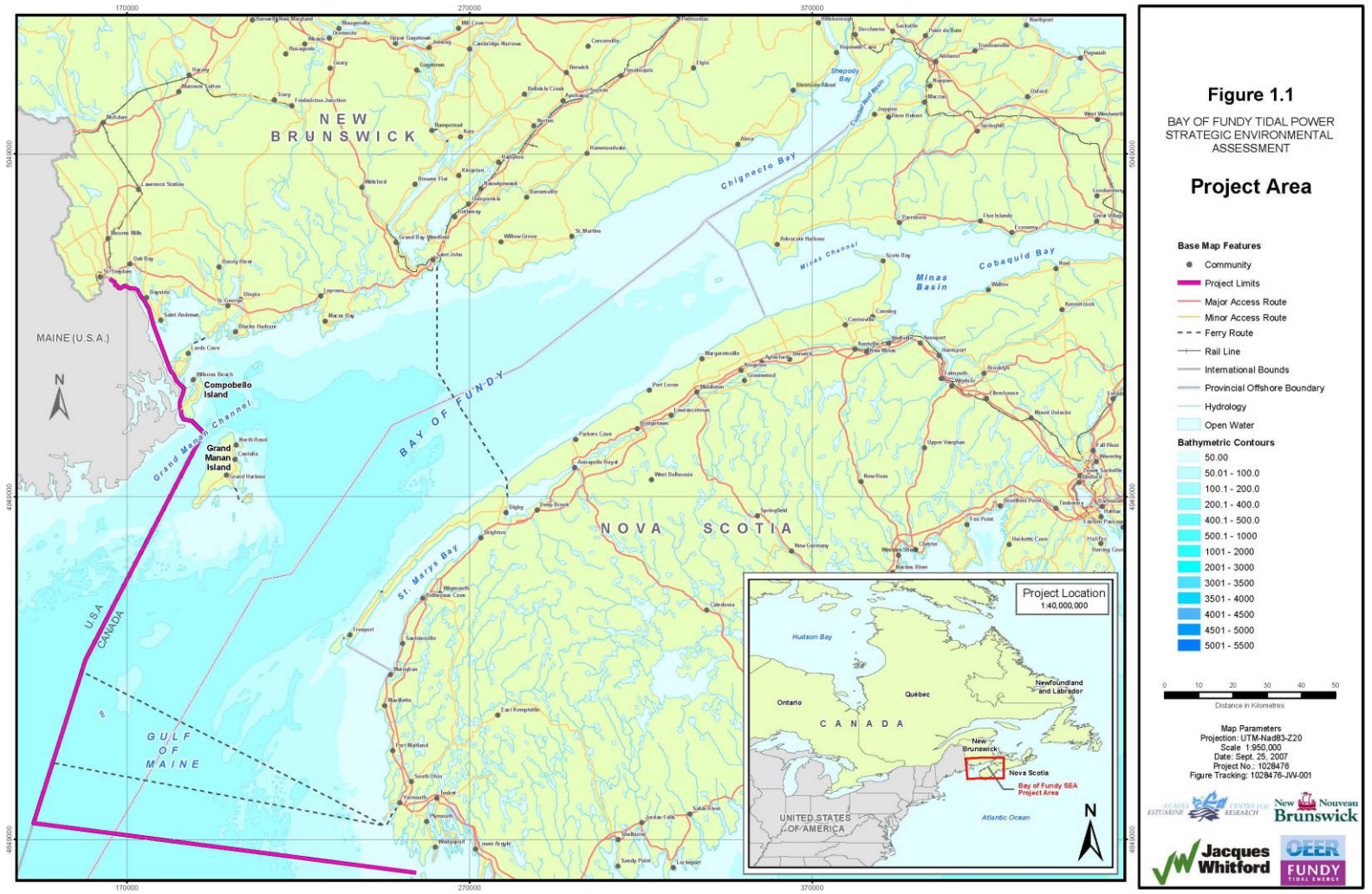
Key Questions Posed

1. Can marine renewable energy technologies be developed without significant impacts on the marine ecosystem?
2. Can these technologies can be developed without significant socio-economic impacts on fishers and the fisheries and on other marine and coastal resource users?
3. What contribution can marine renewable energy technologies make to community and regional economic development in Nova Scotia?

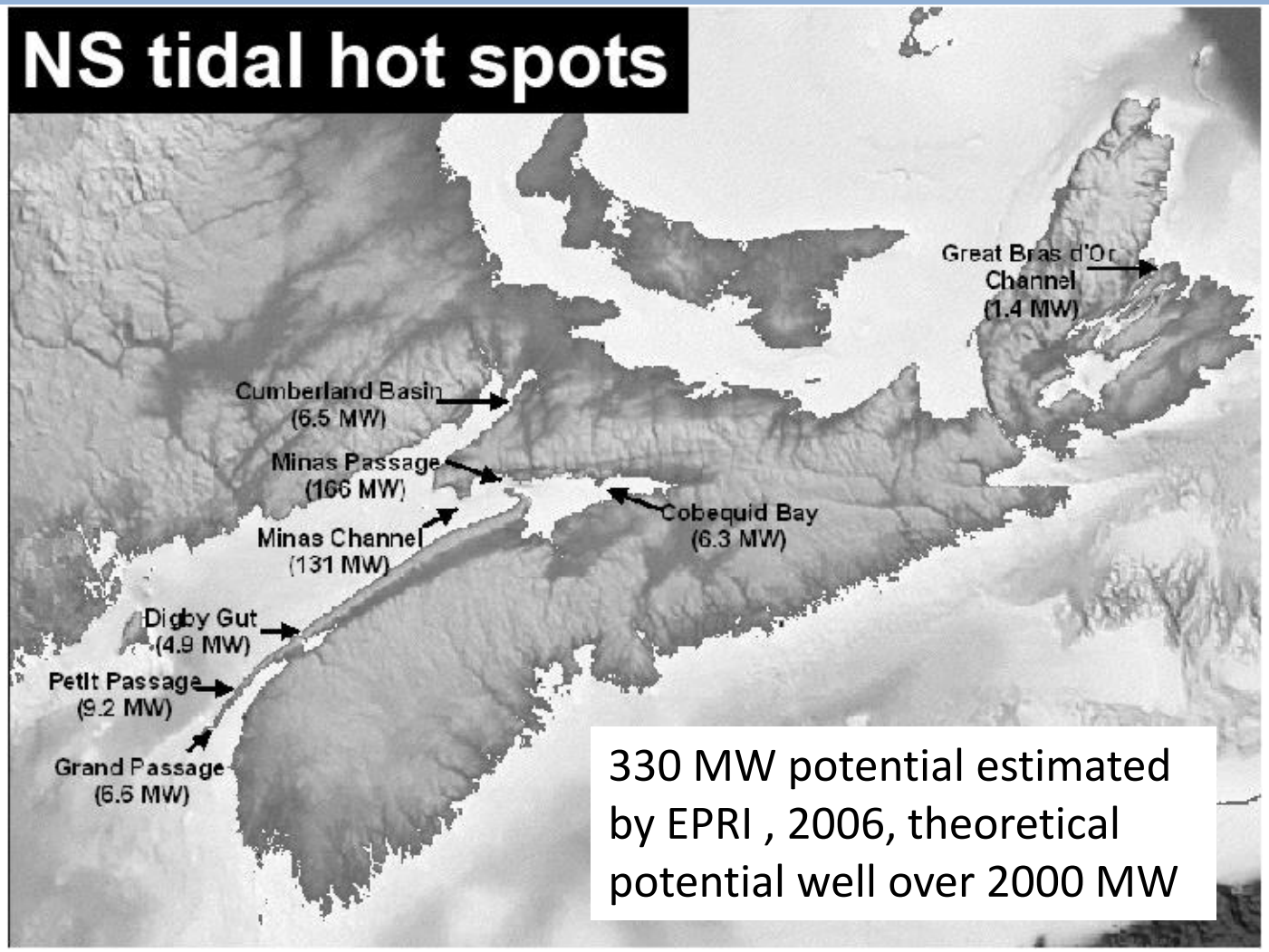
Key Questions ... cont.

4. Under what conditions should pilot projects be permitted?
5. What Q's need to be answered from pilots?
6. What ongoing research and monitoring is required in order to make decisions about commercial developments?
7. What criteria should be used to determine whether, where and how commercial projects should be developed, regulated and managed?
8. How can net long term benefit to NS be ensured and maximized?

SEA Study Area



The Resource



SEA Process .... Part I

- Appointed Tidal Advisory Group (April)
- Monthly newsletters (June -)
- NS & NB commissioned Background Report, prepared by environmental consultants (Sept)
- Six community forums (Aug)
- Appointed 25-person Round Table (Sept)
- 1st round of participation funding awards (Oct)
- No formal scope decision, only areas of focus

SEA Process .... Part II

- Release of Background Report and other information gathered (Jan)
- Written comments on the Background Report and related issues (Jan/Feb)
- 2nd round of Participant Funding
- Ongoing Roundtable dialogue (monthly)
- Draft SEA report released (April)
- Three public workshops on draft (May)
- SEA report finalized! (May)

Stakeholder Round Table

- OEER/provincial government
- Fishing industry
- ENGOs
- Aboriginal organizations
- Municipal government
- Tidal developers
- Nova Scotia Power
- Tourism,
- Shipping,
- …

Participation Support Funds……

❖Funding Criteria:

- Encourage wider participation
- Support relevant locally-based research

❖Funded Topics Include:

- First Nations fishing activity
- Sustainable energy and rural development
- Integrated Coastal Zone Management
- Public engagement
- Fishers' traditional knowledge
- Submerged ice

Key Issues Identified

- What role should marine renewables play in Nova Scotia's energy future?
- How much energy can be removed from the tidal system before it affects ecosystem functions?
- Effects on fish, fish habitat and fishing activity (e.g. exclusion zones)
- Other bio-physical effects
- Will marine renewables contribute significantly to rural development sustainability? How?

Key SEA Recommendations

- **R 1: Sustainability principles to guide decisions**
- **R 2: Allow pilots under certain conditions**
- **R 4: Research program needed to fill gaps**
- **R 13: Incremental approach to development**
- **R 14: Tidal must be part of a bigger sust. energy strategy**
- **R 19: Other users must be treated fairly**
- **R 23: Benefits must be distributed fairly**

The 2013-14 SEA Update

- Two emerging scales, commercial and community
- Knowledge gaps on environmental and socio-economic effects and opportunities remain
- Technical challenges identified:
  - Sensors and instrumentation to get data from the pilots
  - Subsea electricity grid
  - Turbines and moorings
  - Connection between land based and marine based equipment

Questions about the Future

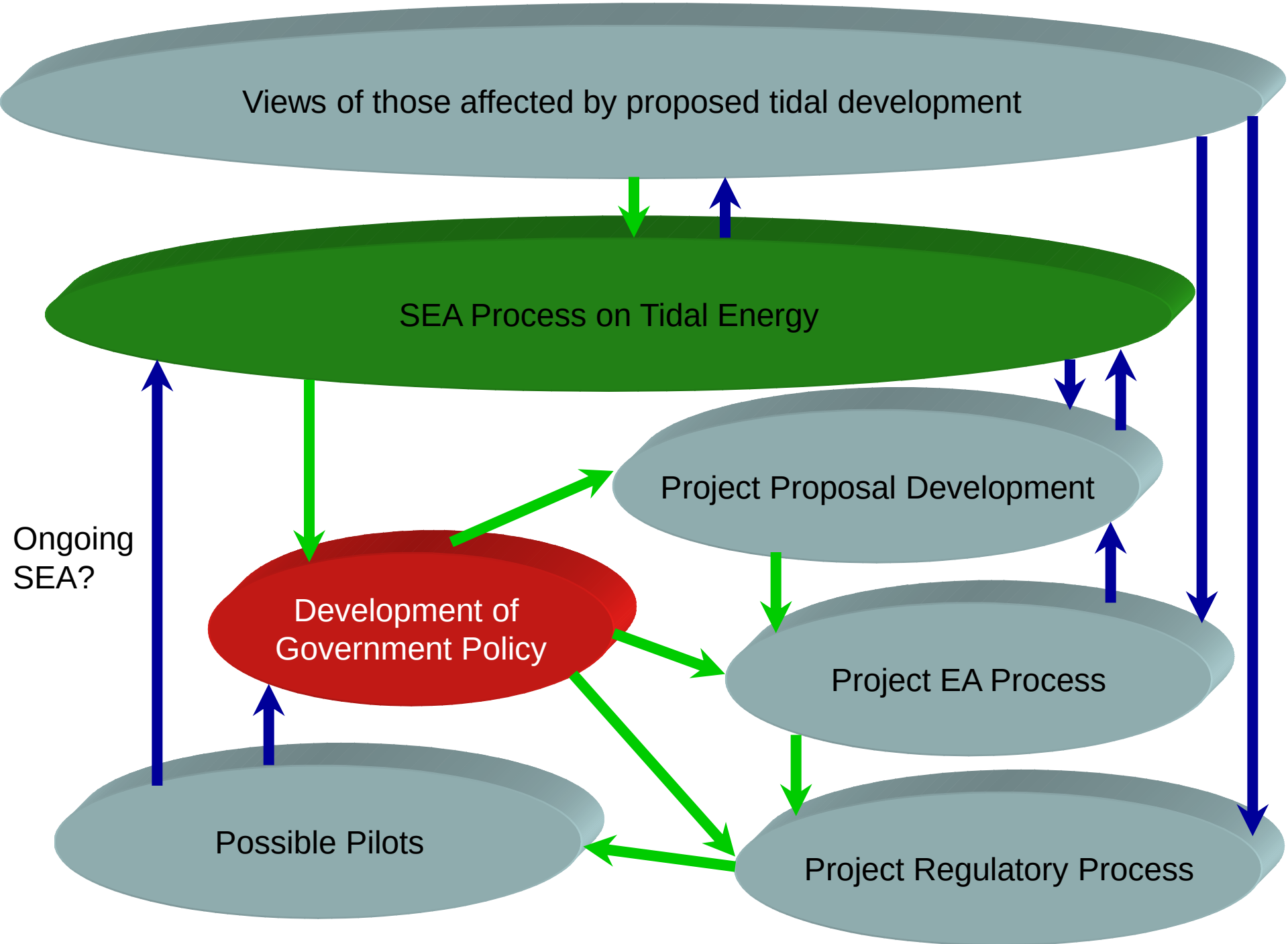
- Will there be ongoing engagement of the public & key stakeholders as we move to individual projects?
- What will/should be the effect of the SEA on existing decision making processes (such as project EA and regulatory approval)?
- Will SEA be a catalyst for integrated planning?
- How to ensure meaningful implementation of these high level recommendations?
- Shelf life of the SEA results?

Questions about the Process

- Was the process sufficiently independent?
- To what extent was the effectiveness of the process limited by its ad hoc nature?
- How much was the process affected by the parallel process for the construction and operation of the research facility?
- Was the process undermined by time and resource constraints, which resulted in limited progress on how to maximize rural development and community benefits?
- Can & will these limitations be overcome through ongoing engagement?
- What are the lessons learned for SEA more broadly?

For more information

www.bayoffundysea.ca


Views of those affected by proposed tidal development
SEA Process on Tidal Energy
Project Proposal Development
Ongoing SEA?
Development of Government Policy
Project EA Process
Possible Pilots
Project Regulatory Process