The City of Eastport, ORPC and a Sustainable Vision for the Future

Presented to

Eastport City Council & Community

July 16, 2020

ORPC

John Ferland, President

Presentation Outline

- History and impact of the City of Eastport and ORPC partnership on advancing tidal energy opportunities
- ORPC's evolution into a global energy solutions company with expertise in microgrids
- A Vision for the Future—Eastport and ORPC partnering on The Eastport Smart Microgrid Project

History and Impact of the City of Eastport and ORPC Partnership on Advancing Tidal Energy Opportunities

ORPC and Eastport—The Pioneering Years

- **2006** Signed MOU to cooperate on development of tidal energy
- **2008** Generated electricity from Bay of Fundy region tidal currents
- **2010** Deployed largest ocean energy device ever in U.S.
- **2012** First ocean energy project to deliver electricity to regional utility grid in all of the Americas

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ORPC and Eastport—The Pioneering Years

- **2014** Prototyped innovative mooring and anchoring technology
- **2014-2015** Eastport-tested RivGen® Power System installed and grid-connected in Alaska
- **2017-2020** Extensive marine mammal monitoring and analysis, and site velocity measurements in Western Passage

Economic Impact—Eastport, Washington Co. & Maine

- 100 local jobs supported
- More than $6 million spent in Washington County alone
- Over 280 partners, contractors, service providers in 14 of Maine's 16 counties
- Over $40 million total spent statewide

Community Efforts

Informational meetings

Marine mammal observation by UMaine and local citizens, shown here with Shead H.S. students.

On-going use of local contractors

Maine College Circle scholarships

Lessons Learned and Results

- Upgraded powertrain components (generator, bearings, electronics and foils)
- Developed new techniques to install and retrieve devices
- Strengthened supply chain for critical components

The next stage of development minimized use of local waters as ORPC adapted to global market opportunity resulting from the success of the multi-year experiences in Maine.

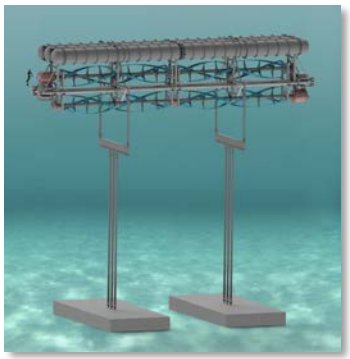
A Decade of Innovation from Cobscook Bay to Global Markets

2010
Largest ocean energy device deployed in U.S.

2012
First ocean energy device to connect to regional grid in all of the Americas

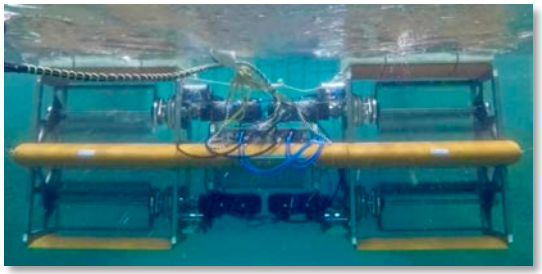
2013
Catamaran retrieval reduces costs by 60%

2014-2015
Self-deployment using ballast system

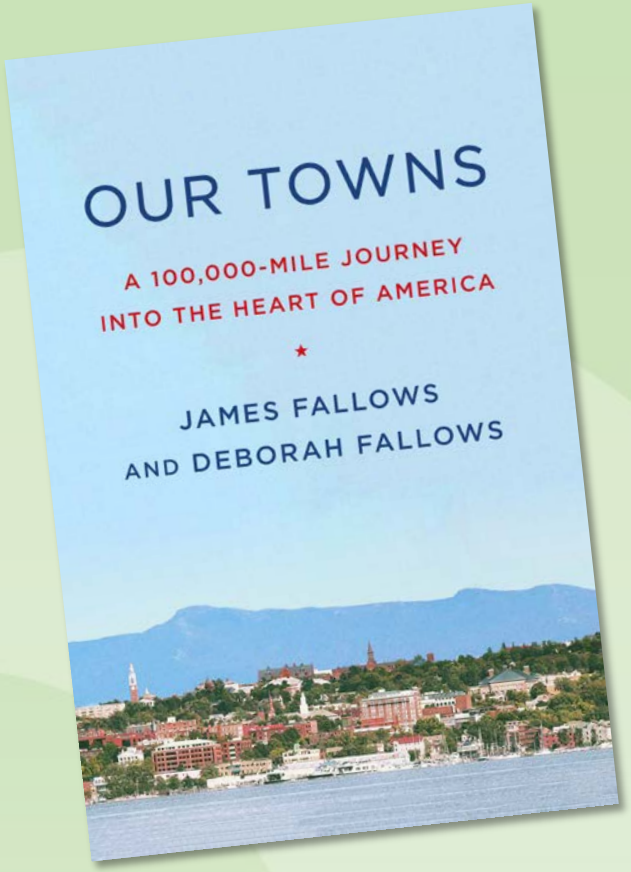


2016-2019
Buoyant tensioned mooring system

2019-2021
Commercial river system with storage and smart grid



2020s
Autonomous, self-propelled system



"This is the way the cleaner-energy revolution is happening around the world: project by project, improvement by improvement, small engineering refinements amounting to significant steps forward in practicality."

— James Fallows

From "Eastport Update: Electric Power from the Sea," https://www.ourtownsbook.com/article/eastport-update-electric-power-from-the-sea, 2016

ORPC's Evolution into a Global Energy Solutions Company with Expertise in Microgrids

ORPC in North America and Europe

- ORPC has 18 employees in Maine, and 28 total, including at subsidiaries in Canada and Ireland.
- New opportunities and partnerships occurring in Chile.
- Technology and research partners, include NREL, Sandia National Labs, Univ. of Maine, Univ. of Washington & Univ. of Alaska

UAA University of Alaska Anchorage

UCC University College Cork, Ireland

1865 The University of Maine

University of Washington

NREL National Renewable Energy Laboratory

Sandia National Laboratories

Igiugig, Alaska—First Commercial Project for ORPC

- Remote river community on microgrid
- One RivGen device installed in 2019 and operating year-round
- Smart grid technology added in 2020
- Second RivGen device added in 2021 will decrease village's diesel use by 90%, and noise and environmental risk of flying in, storing and burning diesel

Project site

Village of Igiugig

RivGen assembly area

- Outcomes will include decrease of estimated 230 metric tons/year in CO_2 emissions and $50,000/year less in O&M costs

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Vision for the Future—
Eastport and ORPC
Partnering on the
Eastport Smart Microgrid Project

What is a Smart Microgrid?

An electricity supply network using digital communications technology to detect and react to local changes in usage

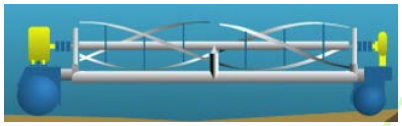
Designed to meet energy needs of local community

Typically includes renewable energy, energy storage and tools to manage energy consumption

Connects to utility's main network or operates independently

A Model Smart Grid City Operating on 100% Local Renewable Energy

Eastport Smart Microgrid Solution



ORPC Power System
Baseload power

+

Solar and other intermittent power sources

+

Energy Storage

+

The Grid
Option to integrate or operate separately

Smart Controls

Community-scale, baseload power, delivered year-round

The Eastport Opportunity

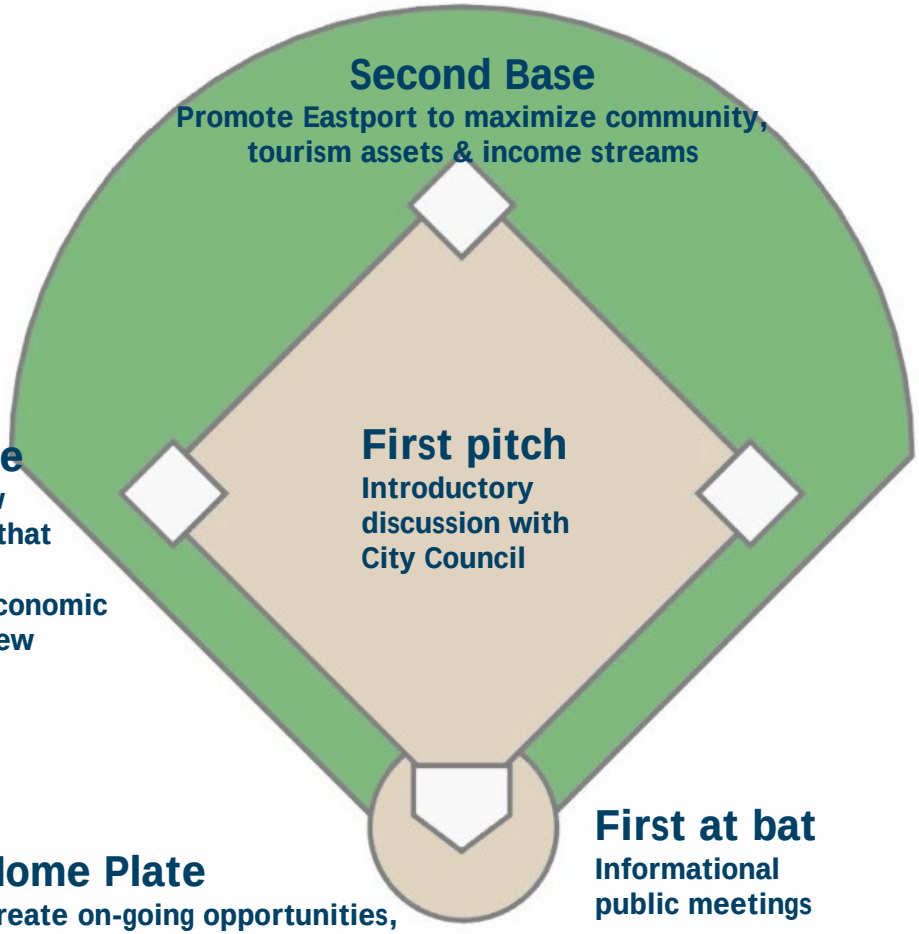
PROVIDE 100% OF COMMUNITY'S ENERGY NEEDS WITH RENEWABLE ENERGY

COLLABORATE WITH VERSANT POWER ON CREATING A RESILIENT AND ADAPTABLE GRID OF THE FUTURE

CREATE VISION FOR ECONOMIC DEVELOPMENT & COLLABORATION WITH EDUCATIONAL INSTITUTIONS, WITH POTENTIAL FOR VISITOR CENTER

BECOME A MODEL SMART GRID CITY FOR OTHERS TO FOLLOW

Where to begin? We proceed one base at a time…



Second Base
Promote Eastport to maximize community, tourism assets & income streams

Third Base
Welcome new technologies that contribute to sustainable economic growth and new opportunities

First pitch
Introductory discussion with City Council

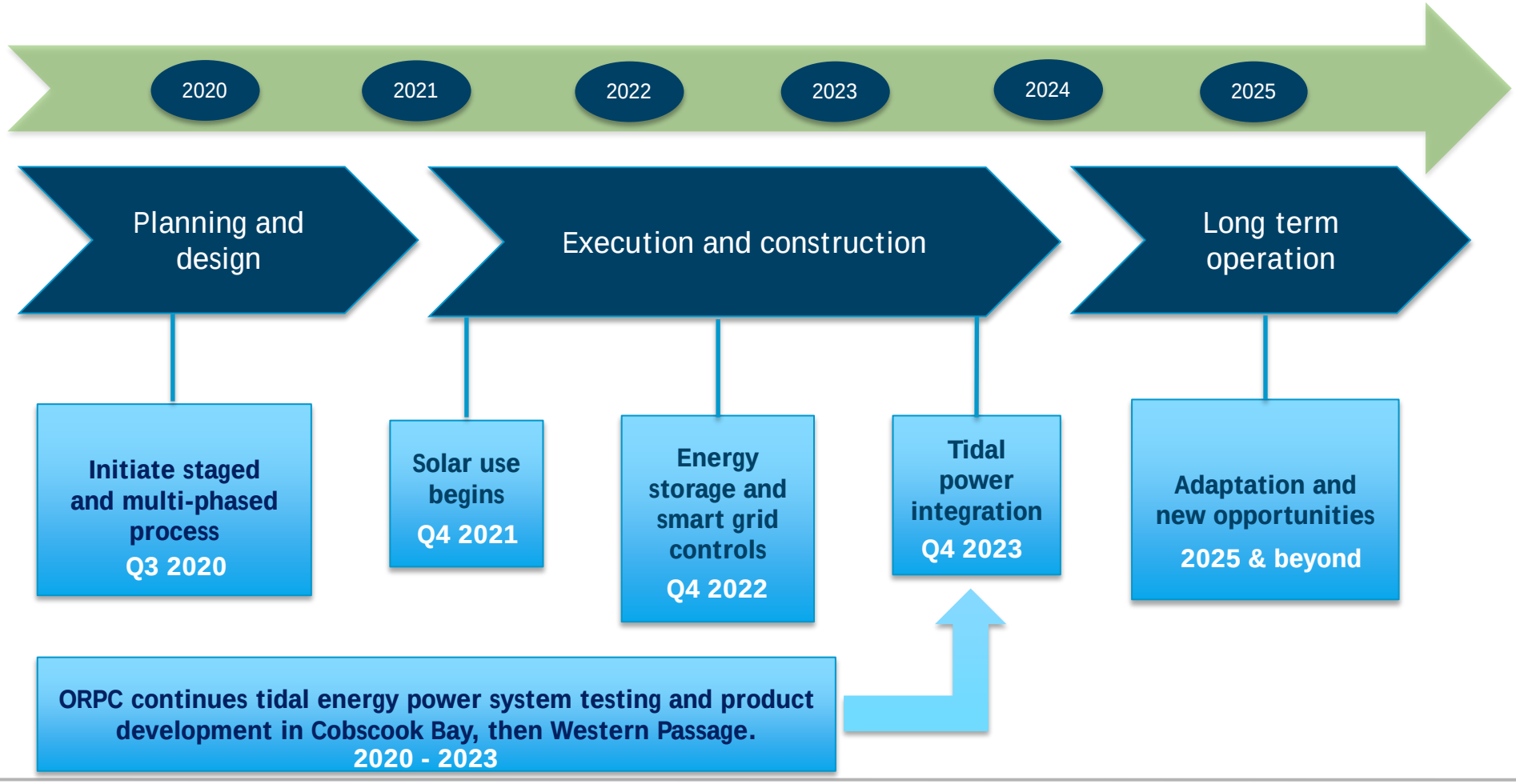
First Base
Create resiliency, ensuring consistent electricity availability

First at bat
Informational public meetings

Home Plate
Create on-going opportunities, export knowledge and skill sets, and be a model for other communities

…and score lots of runs!

Major Project Stages



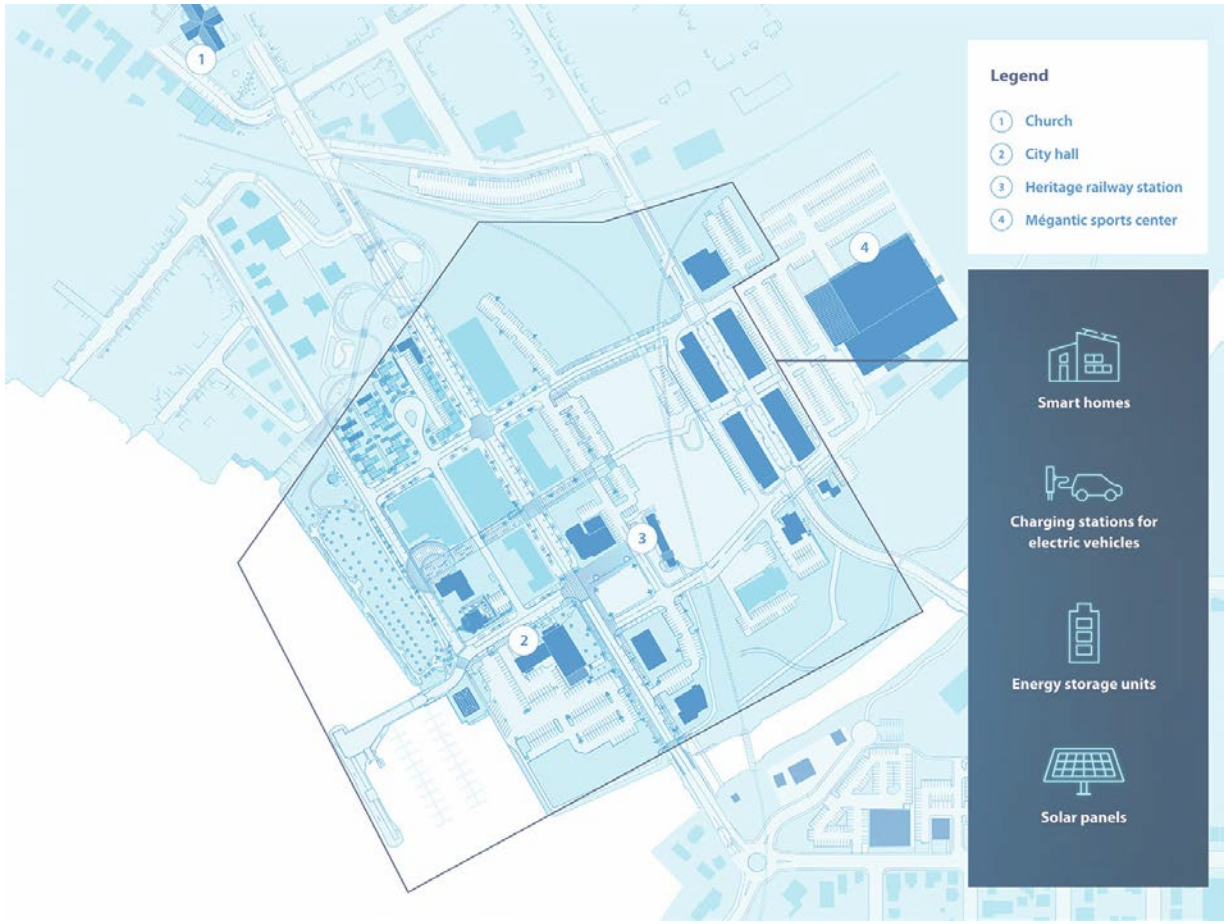
Who else is doing this?

- Quebec
- New York
- North Carolina
- Alabama
- Illinois
- And many other places

https://smartcitiescouncil.com/

Lac Megantic, QC

- Recovery from rail disaster
- Reconstructing downtown
- Focus on innovation and sustainability
- Quebec Model for grid of the future



- Solar
- Energy Storage
- Interactive building systems
- Public safety
- Electrified transportation and recreation
- R&D opportunity for Hydro Quebec
- Partnership with local college

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Aligns with Market Direction, State Goals & Funding Priorities

Market & Policy Direction in Maine	Eastport as a Market Leader and Model	Public and Private Funding Availability
Carbon neutral by 2045	Potential 100% renewables use	Multiple funding opportunities exist within federal and state government, and from private investment, that support carbon reduction, increased use of renewables and smart grid usage
Non wires alternatives to transmission	Capacity & resiliency without adding infrastructure	
100,000 heat pumps by 2030 with financial incentives	Opportunities for increased energy efficiency and building performance	
Increase electric vehicle infrastructure with financial incentives	Enable EV integration for residents, businesses and tourists	

ORPC Request to Eastport City Council

- Sign MOU that continues the positive and long-term partnership between the City of Eastport and ORPC
- ORPC to work with City administration to further define project, schedule and funding opportunities
- Support a series of informational meetings for the community
- Periodically update and present to the City Council
- No official municipal action without City Council approval

The Road Ahead

Strengths: There are exciting changes in Maine's electricity market favorable to local communities like Eastport now.

Weaknesses: Patience and perseverance will be needed to carry out this complex project.

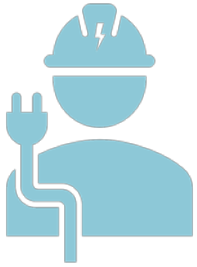
Opportunities: This project will create economic opportunities with multiple benefits.

Threats: Competition is everywhere—from from the status quo, to other communities seeking the same solutions and funding.

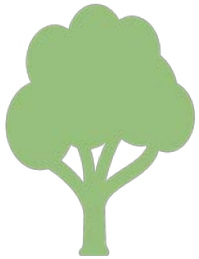
Summary and Conclusion

Jobs for local contractors and providers of services and supplies; increased tax revenue for community

Job training and skills development in a growing field for students of local schools and colleges



Eastport cultivates an image as a residential or business opportunity (work remotely, electricity intensive businesses, etc.)



Eastport enhances tourism brand as unique visitor destination featuring no carbon energy supply, extraordinary natural beauty and a culture of overall environmental sustainability

Can a Small Maine Town's Innovation Turn the Tides on Sustainable Energy?

PBS NEWS HOUR

The New York Times

The Search for Energy Takes a Turn Underwater

Thank you, Eastport, for 14 years of partnering!

The Boston Globe

In Maine, a US first in tidal energy

FAST COMPANY

MOST INNOVATIVE COMPANIES 2013

THE WORLD'S TOP 10 MOST INNOVATIVE COMPANIES IN ENERGY

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Sustainable Off-Grid Energy for Communities

https://youtu.be/GxjELfnX5xc