



# OpenHydro Presentation

sea THE FUTURE®

openhidro  
— a DCUS company

Sue Barr | OpenHydro | 6<sup>th</sup> February 2015

# Agenda

1. Technology Development
2. Demonstration Array
  - Canada | Cape Sharp Tidal
  - France | Paimpol-Bréhat
3. Industrialisation
4. Commercial Arrays

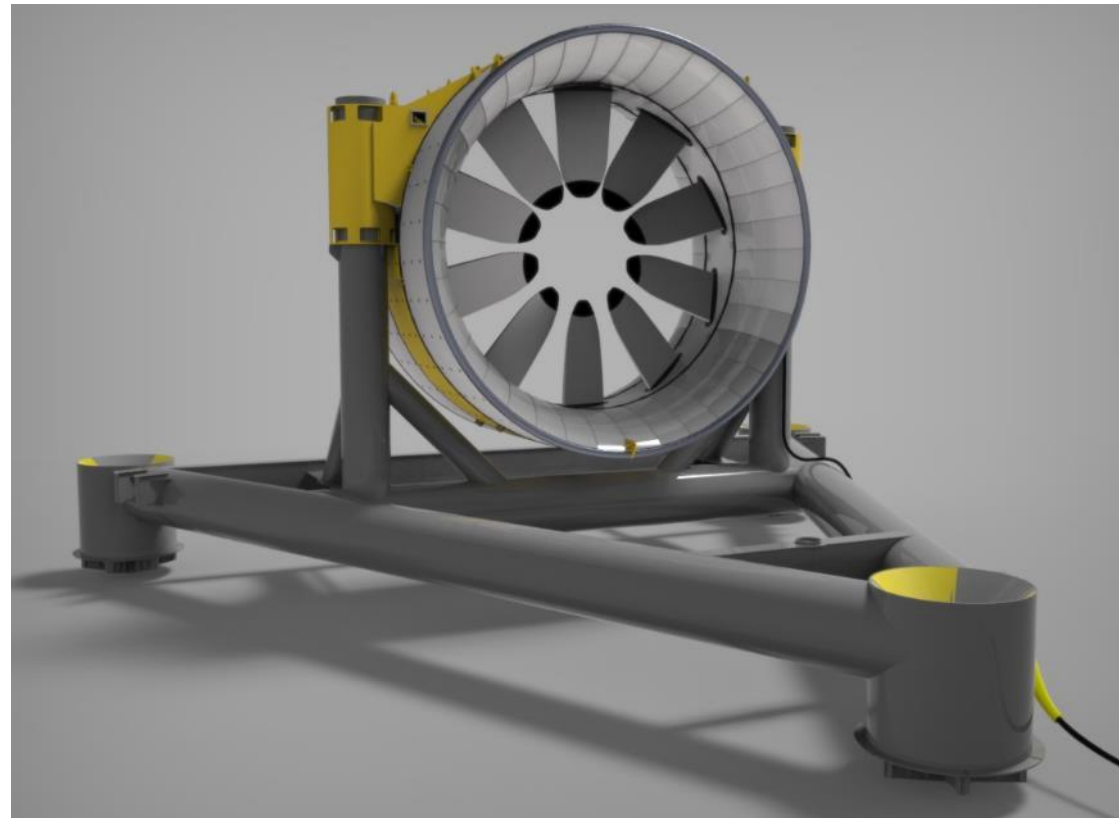
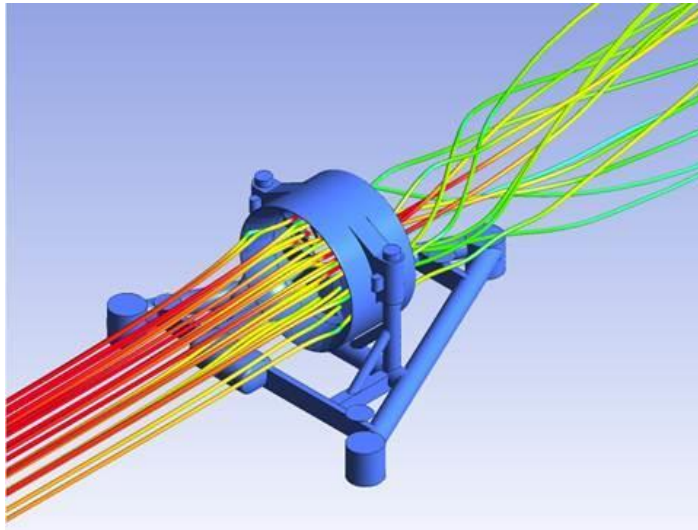
# Technology Development



# Technology Development

## Turbine Design

- OpenHydro has a strategy for a standard system design that can be deployed across all our sites.
- Design of our Pre-Series turbine is complete and procurement for the first 4 units has commenced.



# Technology Development

## Turbine Testing

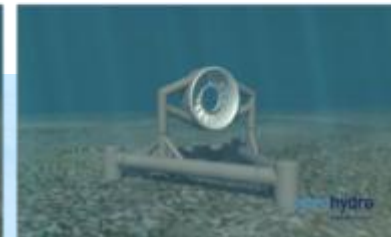
- OpenHydro has been testing at the European Marine Energy Centre (EMEC) since 2006; grid connected in 2008.
- EMEC remains the location where we test new developments and technologies.



# Technology Development

## Deployment System

- Patented installation and recovery system demonstrated in Scotland, Nova Scotia and France.



# Demonstration Array

## Demonstration Arrays





Customer: **Emera**

Location: **Bay of Fundy**

Installation: **2015**

Scale: **2 x 16m**

Turbine Rating: **2MW**



Customer: **EDF**

Location: **Paimpol-Bréhat**

Installation: **2015**

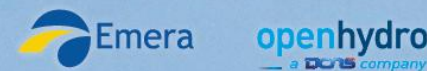
Scale: **2 x 16m**

Turbine Rating: **2MW**

# Demonstration Array

## Cape Sharp Tidal | Bay of Fundy

- During 2015 OpenHydro and Emera plan to install a 4MW demonstration array in the Bay of Fundy,
- This is part of a multi phase development (subject to regulatory approvals):
  - **Phase 1 (2015):** 4MW array at FORCE.
  - **Phase 2 (2017):** Installation of additional 12MW.
  - **Phase 3 (2019):** Increase array size to 50MW.
  - **Phase 4 (2020+):** 300MW commercial project.



### Bay of Fundy tidal energy project 2015-2020+



2015	2020+
2 turbine array	Commercial scale farm
4MW	300MW
Grid-connected	Supplying over 75,000 homes
Local manufacturing	Up to 950 jobs

sea THE FUTURE

[www.openhydro.com](http://www.openhydro.com)



# Demonstration Array

## EDF | Paimpol-Bréhat



- EDF Paimpol-Bréhat project is divided into two phases:
  - **Phase 1:** Testing of a prototype 16m turbine at the Paimpol-Bréhat test facility.
  - **Phase 2:** Grid connection of a two turbine array at Paimpol-Bréhat.

## Phase 1

- The prototype turbine was installed in December 2013 and safely recovered in April 2014 as planned.
- During the test the turbine successfully completed 1,800 hours of operation against the target of 500 hours.



# Demonstration Array

## Phase 2

- Phase 2 will consist of two grid connected Pre-Series turbines with GE providing the power convertor system. Deployment and grid connection is planned for 2015.



# Industrialisation

## Industrialisation



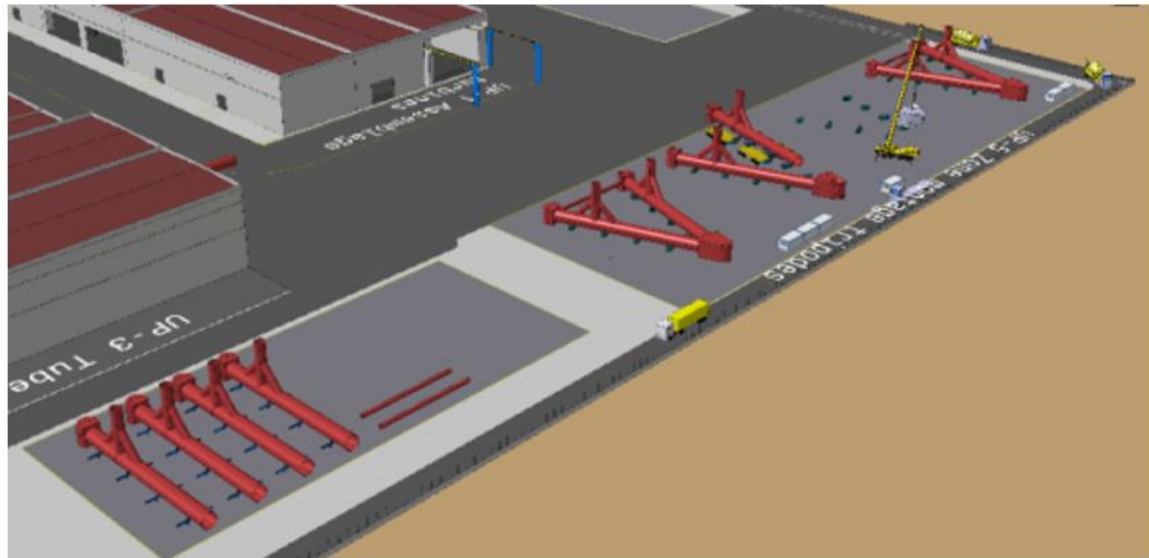
## Team Development

- **OpenHydro Canada:** To deliver current and future projects we have appointed a Canadian Country Manager. We now have a local team of 10 in Nova Scotia.
- **OpenHydro France:** Similarly, we have appointed a French Country Manager. OH is in the process of building the team in France.

# Industrialisation

## Local Manufacture

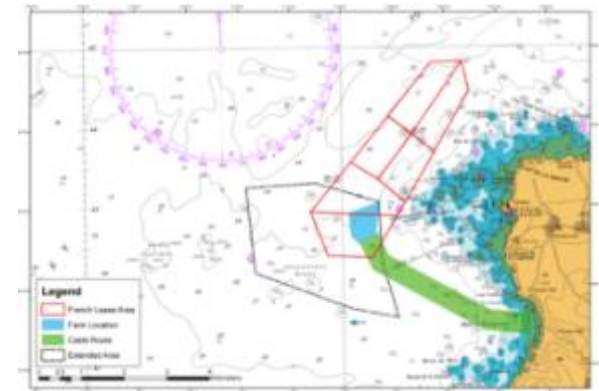
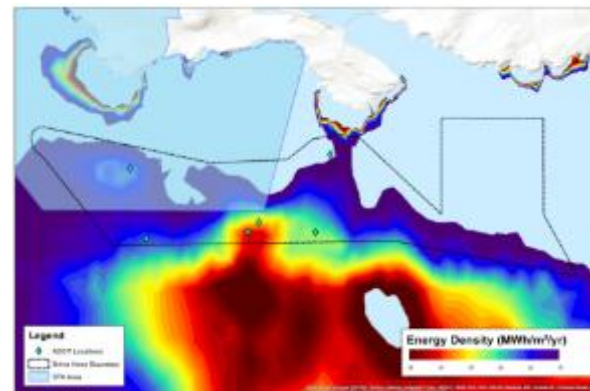
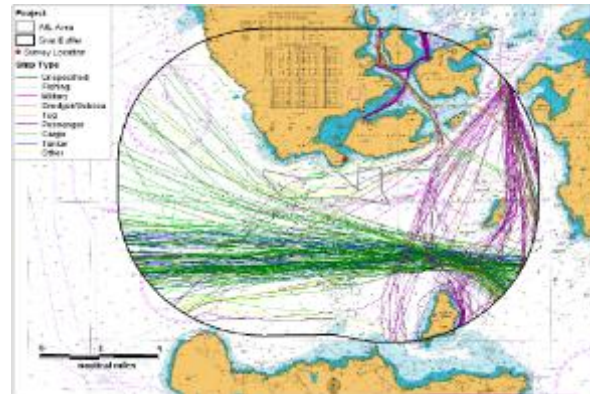
- OpenHydro plans on assembling turbines at industrial volume local to the tidal site.
- This will result in significant investment and job creation.
- OpenHydro's business plan projects the creation of 950 jobs (direct and indirect) for a facility producing 100MW/yr.



# Commercial Arrays

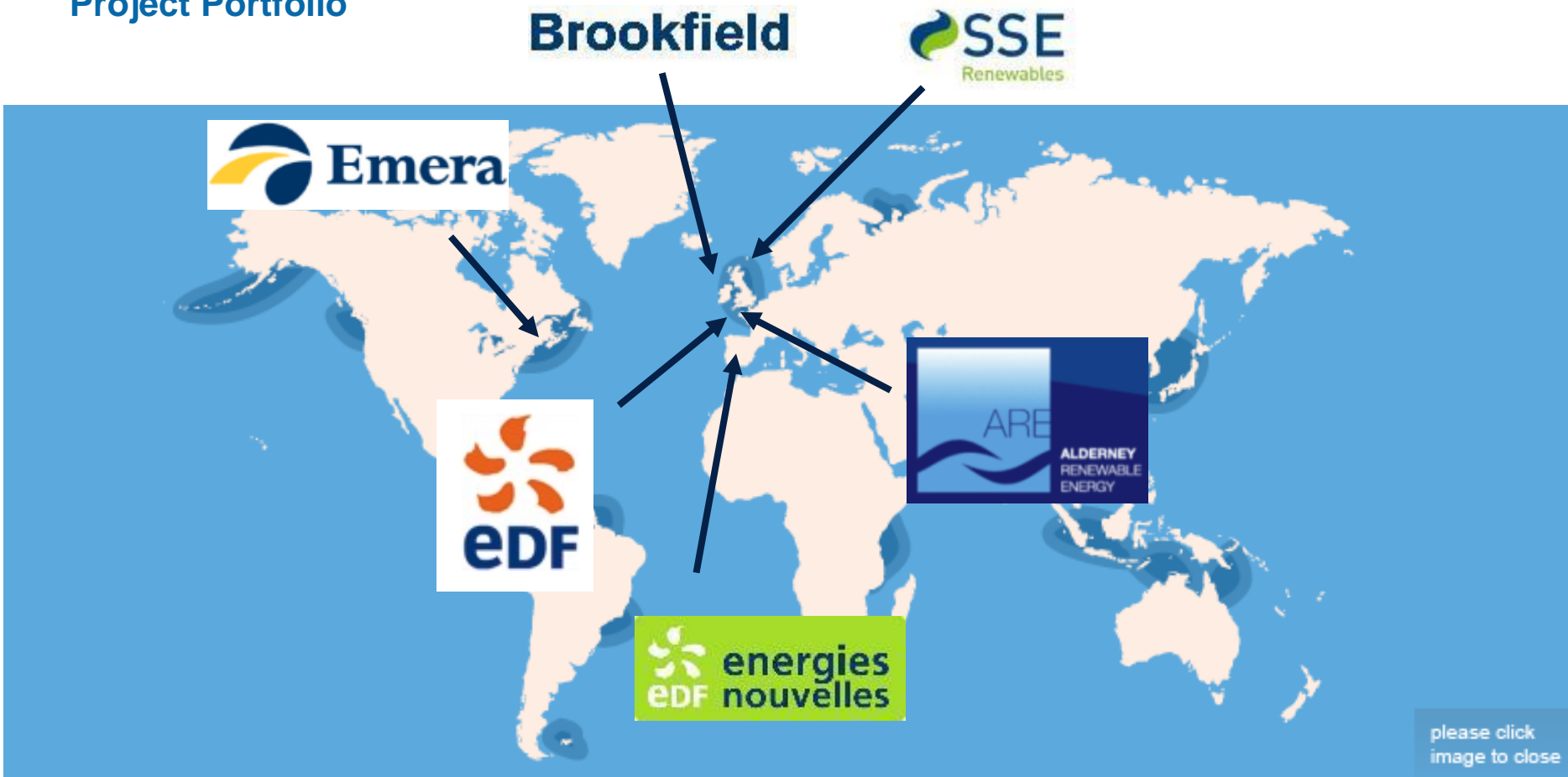
## Commercial Project

- Given the development timescales it is important to build a project pipeline in parallel with technology and industrial development.
- OpenHydro has a significant portfolio of projects under development with utility/development partners.



# Commercial Arrays

## Project Portfolio



# Commercial Arrays

## Project Portfolio

- OpenHydro has over 930MW of projects under development
- These projects cover France, Scotland, Northern Ireland, Channel Islands and Canada.



# Commercial Arrays







# OpenHydro Presentation

sea THE FUTURE®

openhidro  
— a DCUS company

Sue Barr | OpenHydro | 6<sup>th</sup> February 2015