INTRODUCTION TO MEGAROLLER PROJECT

Dr. Tuula Mäki, Product Quality and Certification Manager
AW-Energy Oy

WAVEROLLER

CONTENT

Introduction to WaveRoller

- Wave energy converter that produces electricity from ocean waves
- Finnish SME behind WaveRoller

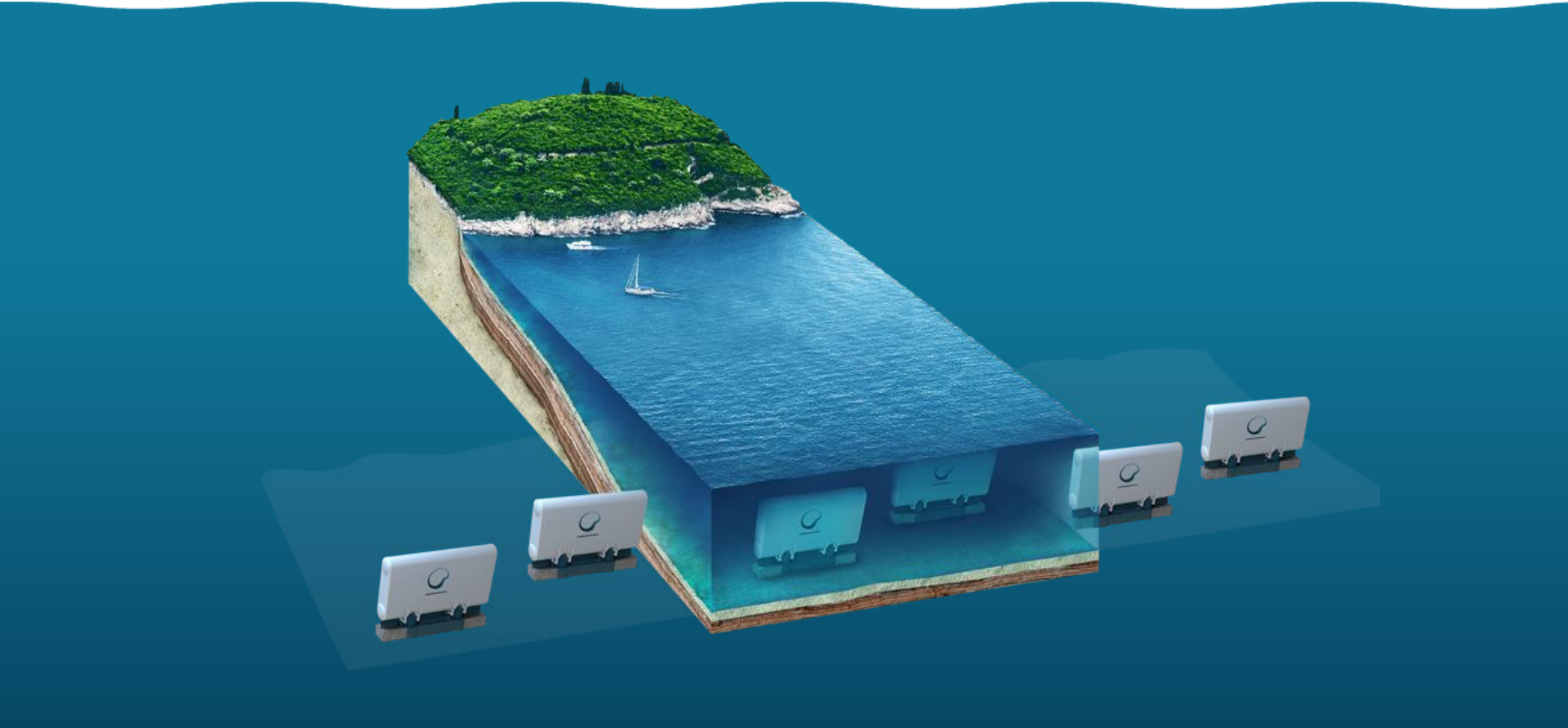
Introduction to MegaRoller

- Funding instrument
- EU-funded MegaRoller project

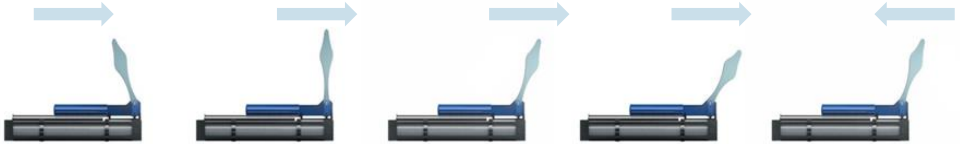
Coordination from SME point of view


WaveRoller licensed and grid connected test site in Peniche, Portugal

WAVEROLLER FARM

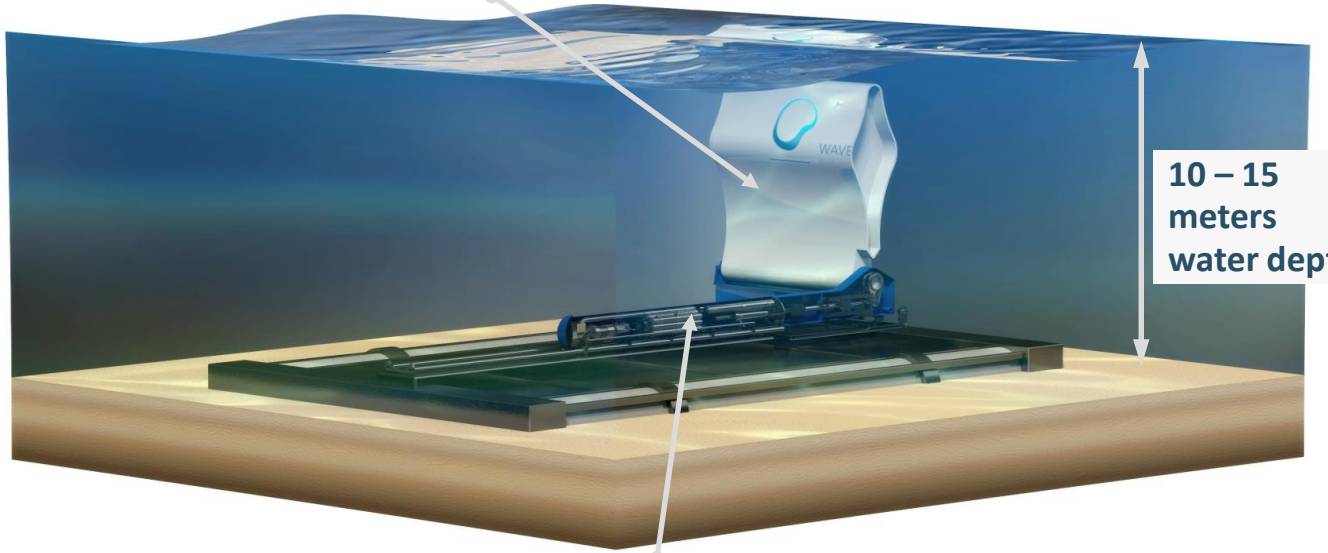


WAVEROLLER WORKING PRINCIPLE



Oscillating wave surge converter:
WaveRoller panel moves back and forth following the movement of water

Panel moves back-and-forth following the waves



WAVEROLLER

Power take-off converts the back-and-forth movement to electricity

OVERVIEW OF THE COMPANY

AW-ENERGY HAS DEVELOPED AND PATENTED A GROUND-BREAKING CONCEPT AND PRODUCT DESIGN, KNOWN AS WAVEROLLER®

STRONG IPR: 40 WORLDWIDE PATENTS, + 40 PATENT APPLICATIONS CURRENTLY IN PROCESS

INDEPENDENT THIRD PARTY **PERFORMANCE VALIDATION BY DNV GL** AND ONGOING **TECHNOLOGY CERTIFICATION BY LLOYD'S REGISTER**

PIPELINE OF COMMERCIAL PROJECTS WITH ACTIVELY ONGOING DEVELOPMENT **IN 8 COUNTRIES ON 4 CONTINENTS**

The inventor of the WaveRoller® Mr. Rauno Koivusaari runs today company's offshore operations.

GLOBAL POTENTIAL OF WAVEROLLER

EU FUNDED PROJECT MEGAROLLER

MEGAROLLER PROJECT

Funding instrument:

- Topic: Developing the next generation technologies of renewable electricity and heating/cooling
- Topic identifier: LCE-07-2016-2017
- Type of action: RIA Research and Innovation
- Specific challenge: Ocean Energy: Development of advanced ocean energy subsystems: innovative power take-off systems and control strategies

MegaRoller project:

- Project title: Developing the PTO of the first MW-level Oscillating Wave Surge Converter
- Duration in months: 36
- Budget: 4.9 M€
- Budget for Finnish partners: 3.1 M€

EUROPEAN TEAM

University	Research institute	SME	Large enterprise
UNIVERSITY OF BERGEN	VTT	hydroll THE PISTON ACCUMULATOR COMPANY	ABB
LIN LEIBNIZ-INSTITUT FÜR NEUROBIOLOGIE MAGDEBURG	SINTEF	HYDMAN Hydraulic Manifold Systems	
	WavEC Offshore Renewables	AW-Energy WAVEROLLER®	
		cruz atcheson CONSULTING ENGINEERS	

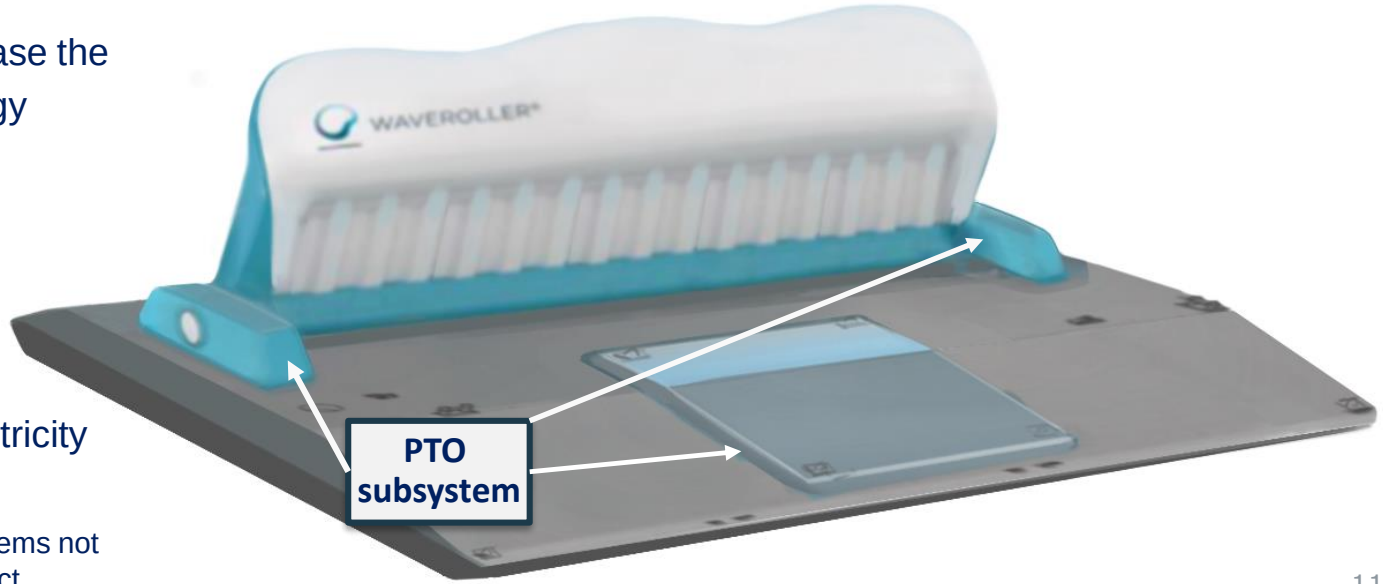
MEGAROLLER PROJECT

MegaRoller PTO concept:

Rotational movement → Linear movement → Hydraulic oil flow → Rotational movement → Electricity

PTO for 1 MW wave energy converter

- Built on knowledge of WaveRoller PTO
- Developed to decrease the LCOE of wave energy converters



PTO=Power take-off

LCOE=Levelized cost of electricity

Note: panel and foundation subsystems not part of EU funded MegaRoller project

MEGAROLLER INNOVATIONS TO REACH KPI

Hardware Innovation

1 2 Modular PTO design

+

1 2 Novel accumulator arrangement

+

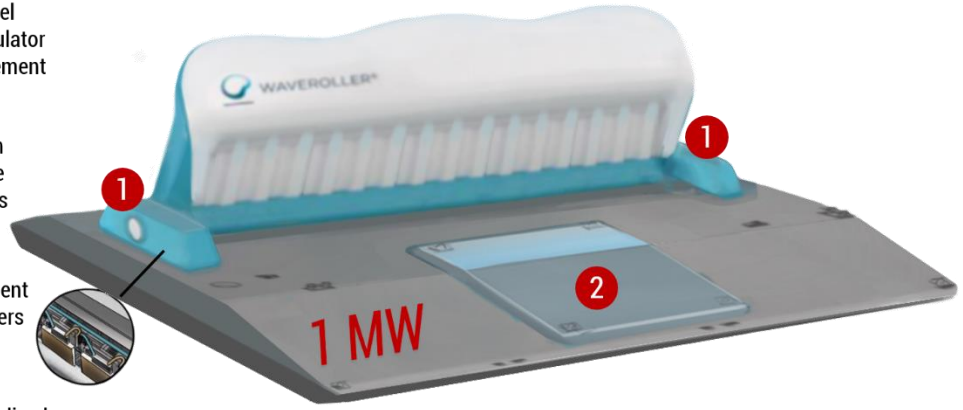
1 Twin drive trains

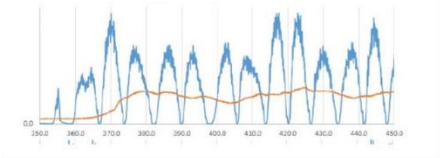
+

1 Intelligent cylinders

+

2 Standardized central power unit





Software Innovation

Wave-by-wave predictions

+

Wave-by-wave damping control

+

Advanced energy storage control

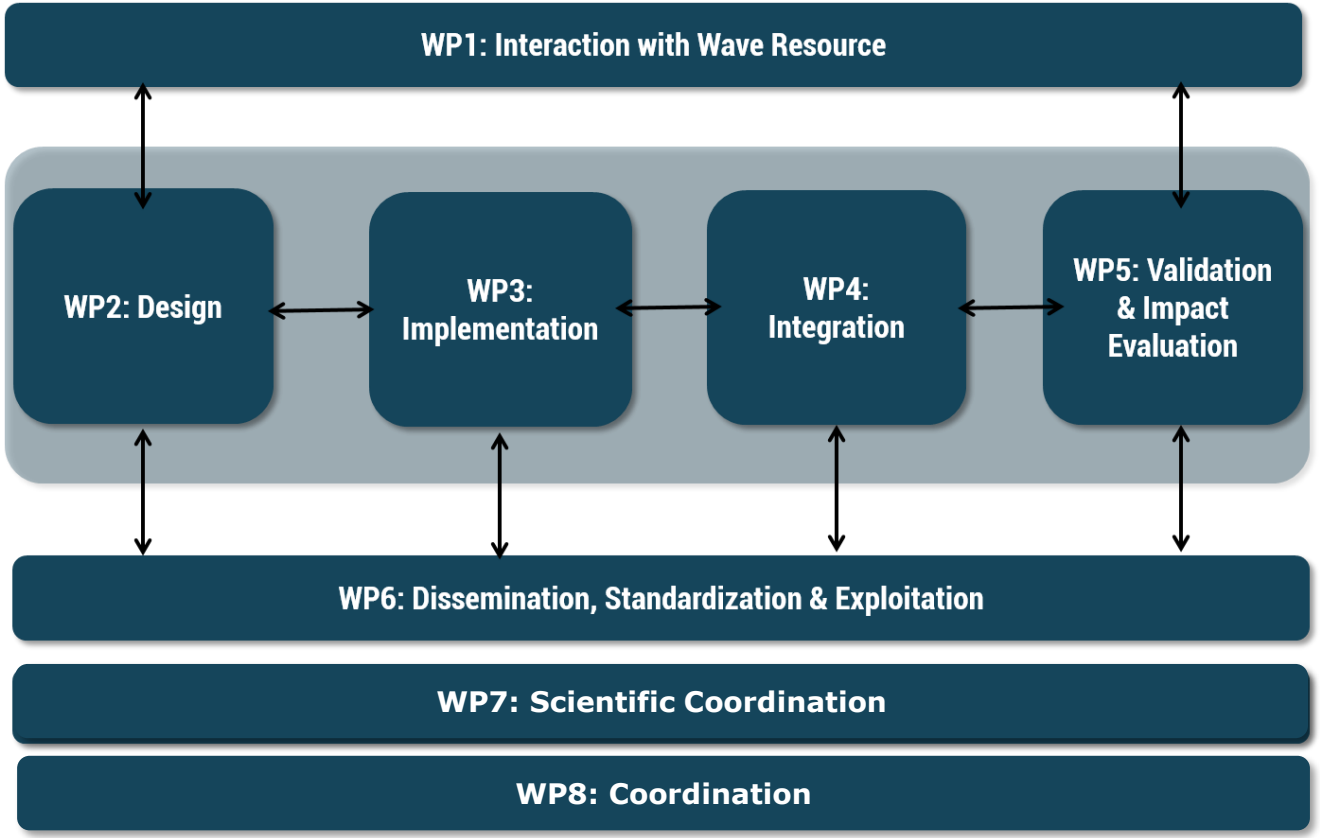
+

Advanced efficiency control

+

Supervisor Controller

HOW WORK IS ORGANIZED



COORDINATION FROM SME POINT OF VIEW

Our view of project coordination in our project:

- **Project leadership needs to have technical leadership and general understanding of technical work**
- **It is beneficial that project leadership is carried out by partner with largest motivation for project success**

Coordinator vs. Scientific coordinator

THANK YOU!