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# OCEAN ENERGY UPTAKE: SOLUTIONS TO TECHNICAL CHALLENGES

# SUMMARY



**01**

**INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION**

**02**

**IEC RENEWABLE  
ENERGY**

**03**

**PROJECT FOCUS**



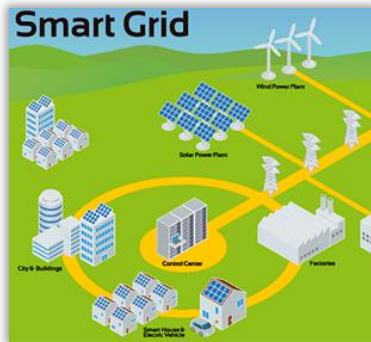
The logo for the International Electrotechnical Commission (IEC) is displayed in white on a dark blue background. It features the letters 'IEC' in a bold, sans-serif font. Below the letters are three horizontal lines of varying lengths that converge towards a white circle on the right side.A vertical red bar is positioned to the left of the text.

01

**INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION**

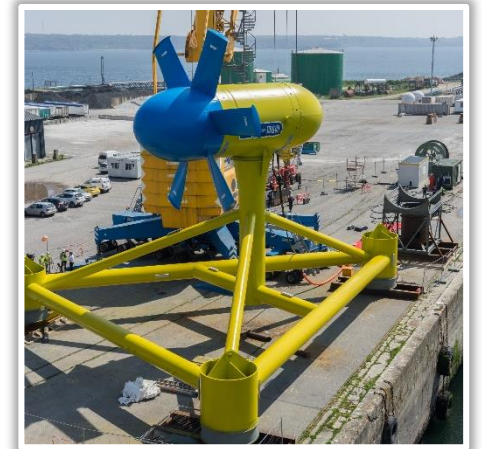
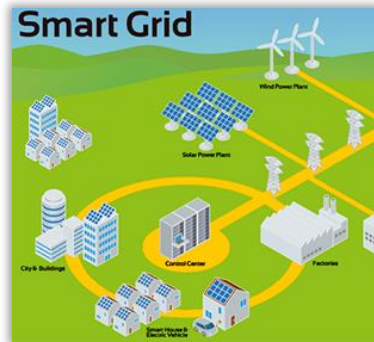
# INTERNATIONAL ELECTROTECHNICAL COMMISSION

## IEC, WHAT IS THIS?



# INTERNATIONAL ELECTROTECHNICAL COMMISSION

## IEC, WHAT IS THIS?



# INTERNATIONAL ELECTROTECHNICAL COMMISSION

## IEC & TC114

### PARTICIPATING COUNTRIES

- Canada
- China
- Denmark
- France
- Germany
- Iran
- Ireland
- Israel
- Japan
- Korea
- Netherlands
- Spain
- United Kingdom
- United States of America

TC114  
Marine Energy – Wave, tidal  
and other water current  
converters



### OBSERVER COUNTRIES

- Belgium
- Brazil
- Czech Republic
- Italy
- Norway
- Poland
- Portugal
- Romania
- Russian Federation
- Saudi Arabia
- Singapore
- Sweden
- Ukraine

# INTERNATIONAL ELECTROTECHNICAL COMMISSION

## IEC & TC114 – PARTICIPATING COUNTRIES



# INTERNATIONAL ELECTROTECHNICAL COMMISSION

## IEC & TC114 – OBSERVER COUNTRIES

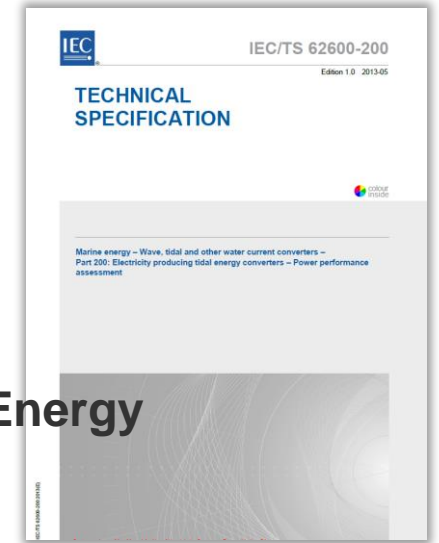




# INTERNATIONAL ELECTROTECHNICAL COMMISSION

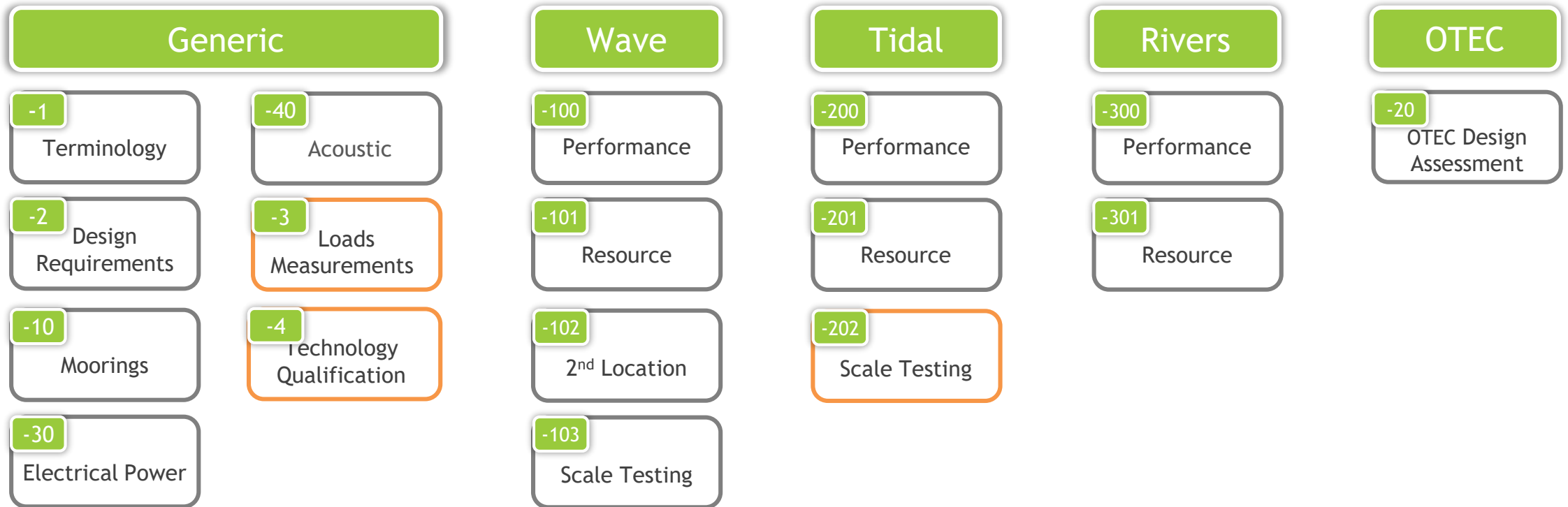
## TC114 OBJECTIVES

- Prepare **international standards** for Marine Energy Conversion systems
- Sectors involved: **Wave Energy, Tidal Energy, River Energy** and **Ocean Thermal Energy**
- Type of organizations involved: **Research institutes, Testing Laboratories, Certification Bodies, Technology Developers, Project Developers, ...**
- Experts are split in **6 Project Teams, 7 Maintenance Teams, 1 Advisory Group** and **5 Ad-Hoc Groups**



# INTERNATIONAL ELECTROTECHNICAL COMMISSION

## TC114 TECHNICAL DOCUMENTS



Published

Under development

The logo for IECRE is displayed on a dark blue background. It features the acronym "IECRE" in large, white, bold, sans-serif capital letters. Below the text is a white graphic element consisting of three horizontal lines of varying lengths that converge towards a solid white circle on the right side.

**IECRE**

**02**

## **IEC RENEWABLE ENERGY**

# IEC RENEWABLE ENERGY

## IEC RE, WHAT IS THIS?

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- System for **Certification** to Standards relating to equipment for use in **Renewable Energy** applications
- Ensure a **uniform implementation and recognition** between **Certification Bodies and Test Laboratories**
- Ensure a **uniform implementation and delivery of information** by **suppliers, end users, ...** for **Certification**
- Ensure a **uniform implementation and clear understanding** of all **suppliers, end users, ...** for the elements and modules as well as reports, statements and certificates of the **Certification Processes**

# IEC RENEWABLE ENERGY

## IEC RE – MARINE ENERGY

Marine Energy

Wind Energy

Photovoltaics

### WG 301 Rules of Procedure

- Definition of **Certification Body** and Test Laboratory
- What are the **Procedures** for the operation of the Marine Energy sector
- What are the Marine Energy **Schemes and Deliverables**
- How to handle sector **specific issues** (test reports, non conformity, etc)

### WG 306 Finance

- **Business Plan and Budget planification** (financial model)
- Evaluate **expenditures and benefits** from Member Bodies of IEC RE ME-OMC
- Evaluate **benefits** from IEC RE **delivered certificates**

### WG 360 Certification Scope of Work

- Definition of **key steps and requirements** to deliver certificates
- **Develop and maintain** a list of Marine Energy schemes and deliverables
- Which **standards** are applicable?
- How to handle sector **specific issues** (test reports, non conformity, etc)

# IEC RENEWABLE ENERGY

## IEC RE, WHAT IS THIS?

### GENERIC

**OD-320**  
Prototype Certificate

**OD-330**  
Component Certificate

**OD-340**  
Type Certificate

**OD-350**  
Project Certificate

### CERTIFICATION BODIES

**OD-310**  
Conformity Statement Requirement

**OD-310-2**  
Conformity Statement for Design

**OD-310-4**  
Technology Qualification Assessment

### TEST LABORATORIES

**OD-300**  
Test Report Requirement

**OD-300-200**  
Tidal Power Performance

**OD-310-3**  
Loads Measurements

- Published
- Under development
- In reflexion

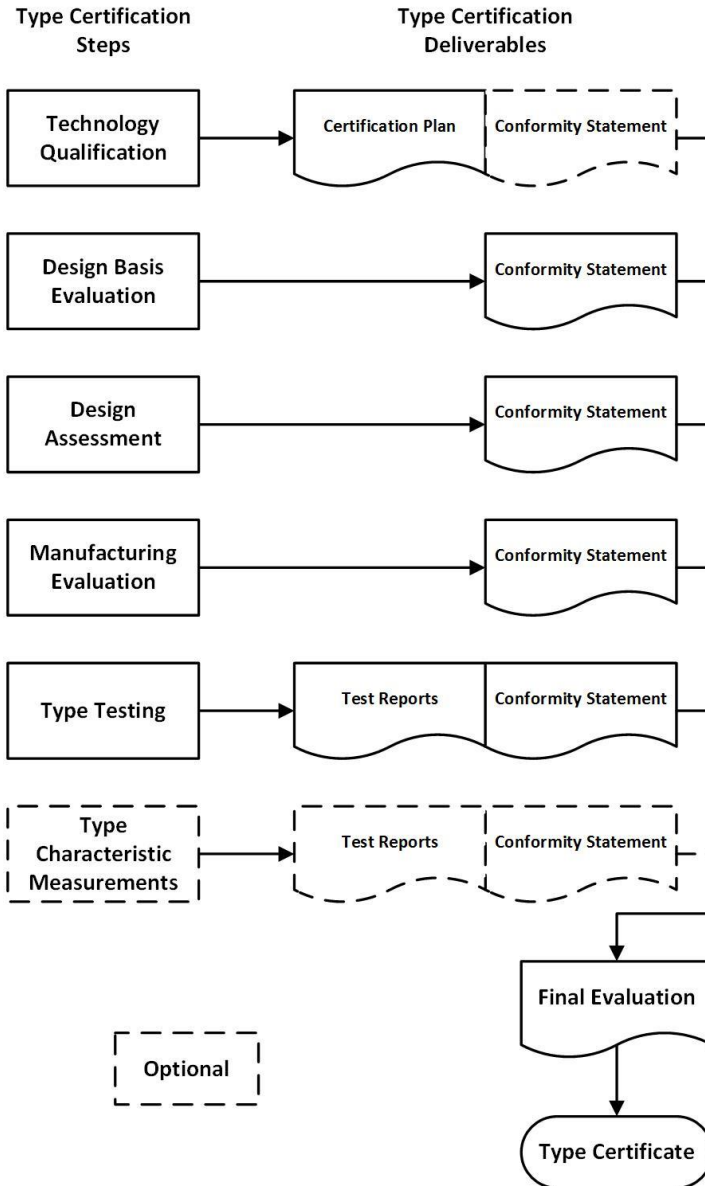


# IEC RENEWABLE ENERGY TYPE CERTIFICATE (UNDER DEVELOPMENT)

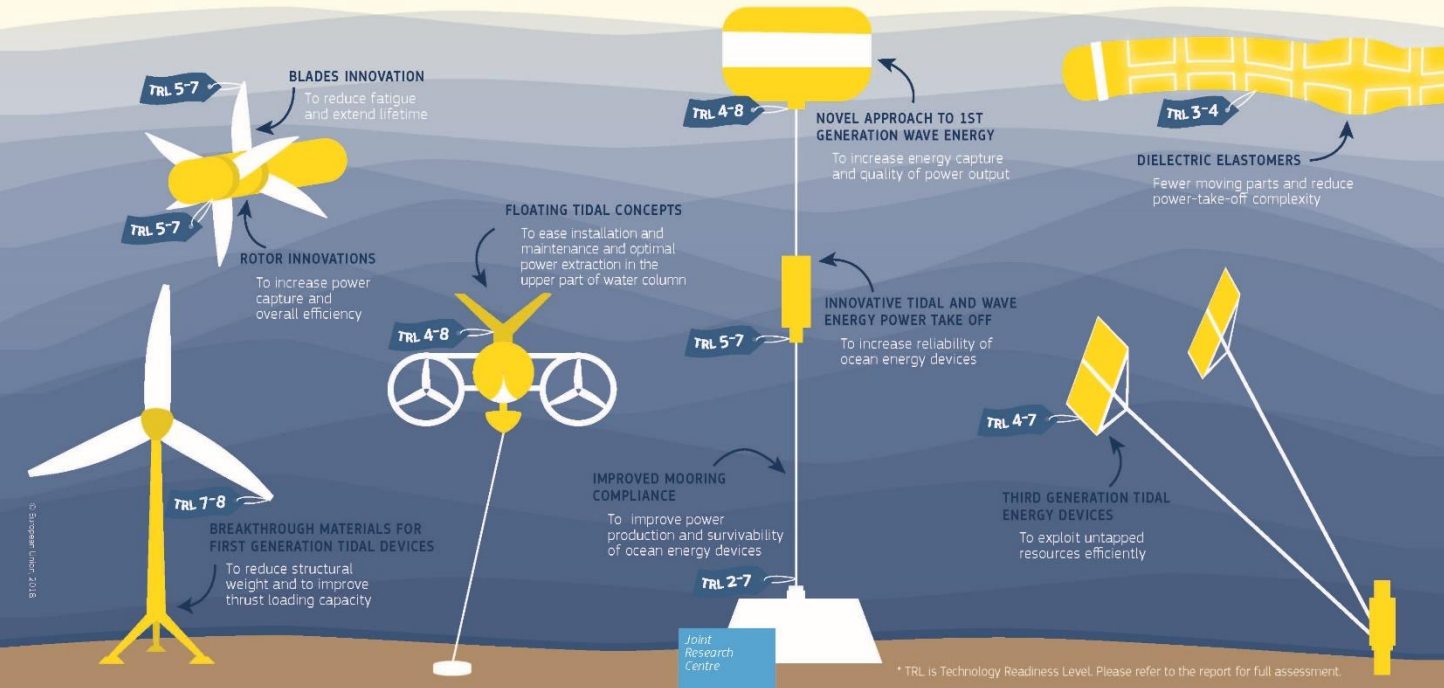
## Type Certificate



A series of standard commercial MEC of common design and manufacture



## How is research tackling the need for **cost reduction** and **reliability** of ocean technologies?



03

# PROJECT FOCUS



# PROJECT FOCUS



→ Provide feedback to **IEC** and **IEC RE**

→ Focus on Tidal (-200, -201, -202 + Generic)



→ Provide feedback to **IEC** and **IEC RE**

→ Focus on Wave (-100, -101, -102, -103 + Generic)



→ Provide feedback to **IEC**

→ Focus on Tidal (-200, -201 + Generic)



**BUREAU  
VERITAS**

**THANK YOU !**