Experiência com o financiamento ‘Lump Sum’ do programa Horizonte Europa

Miguel Vicente

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WavEC
Offshore Renewables

Tópicos da Apresentação

- Breve apresentação do WavEC – Offshore Renewables
- Experiência com o financiamento ‘lump sum’
  - Projecto MEGA WAVE PTO
  - Projecto MISSION
- Conclusões e questões

WavEC
Offshore Renewables

WavEC at a Glance

WavEC at a Glance

WavEC
Offshore Renewables

Purpose

From its **foundation in 2003** WavEC has been committed to the **development and implementation of marine renewables**, foreseeing the urgency of a **new energy paradigm**

Team

Multidisciplinary team of highly qualified personnel, with background in several engineering fields, economics, environment and marine biology

Knowledge transfer

Promotion of knowledge transfer through close **collaboration with universities**, **authorities** and **industry**

Partnerships

Extensive **international partnerships** with research institutes, technology developers, utilities, environmental consultants, etc.

Ownership structure

7 associated partners ranging from industry to academia:

Mission, Vision & Values

Mission

Accelerate an affordable, secure and sustainable **energy transition** and support the growth of the **blue economy**

Vision

Delivering effective **science-based solutions** to drive the **energy transition** and build a viable **blue economy**

Values

Ethical development, **commitment**, **innovation** and **customer focus**

Business Scope and Offer

Offer customers tailored and value-added services

Economy & Business Dev.

- Techno-economic assessment
- Site selection
- Resource assessment
- Market research & data analytics

Marine Environment & Licensing

- Life cycle assessment - LCA
- Marine biology, ecology & acoustics
- Monitoring & data analytics
- Licensing, permitting & consenting

Engineering & Operations

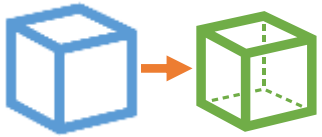
- **Performance monitoring & data analytics**
- Offshore operations & logistics optimization
- Farm layout optimization
- Numerical modelling & wave tank testing (dynamic response, structural loads, power production, etc.)

Global Sustainability Performance

in line with ESG criteria

Offshore Wind | **Wave Energy** | **Floating Solar** | **Green Hydrogen** | **Offshore Aquaculture** | **Carbon Capture**

Services for Offshore Wind Industry



- **Design support and review**
- Moorings design and modelling
- Experimental testing in wave tanks
- Platform & turbine modelling

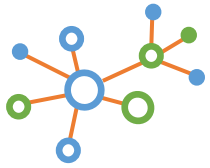
- **Site assessment** (wind resource, layout, energy yield, WTG suitability)
- Grid connection assessment
- Mapping of site attractiveness
- Metocean reports to support design

- **Permitting support**
- Tendering support
- Stakeholder engagement
- Offshore client representation

- **Environmental and Social impact studies**
- Environmental monitoring
- Life Cycle Assessment

- **Advanced O&M studies**
- Weather window assessment
- OPEX forecasts

- **Logistic studies**
- Port assessment and selection
- Vessel assessment and selection
- Third-party review of installation plans
- Storyboards
- Risk assessment



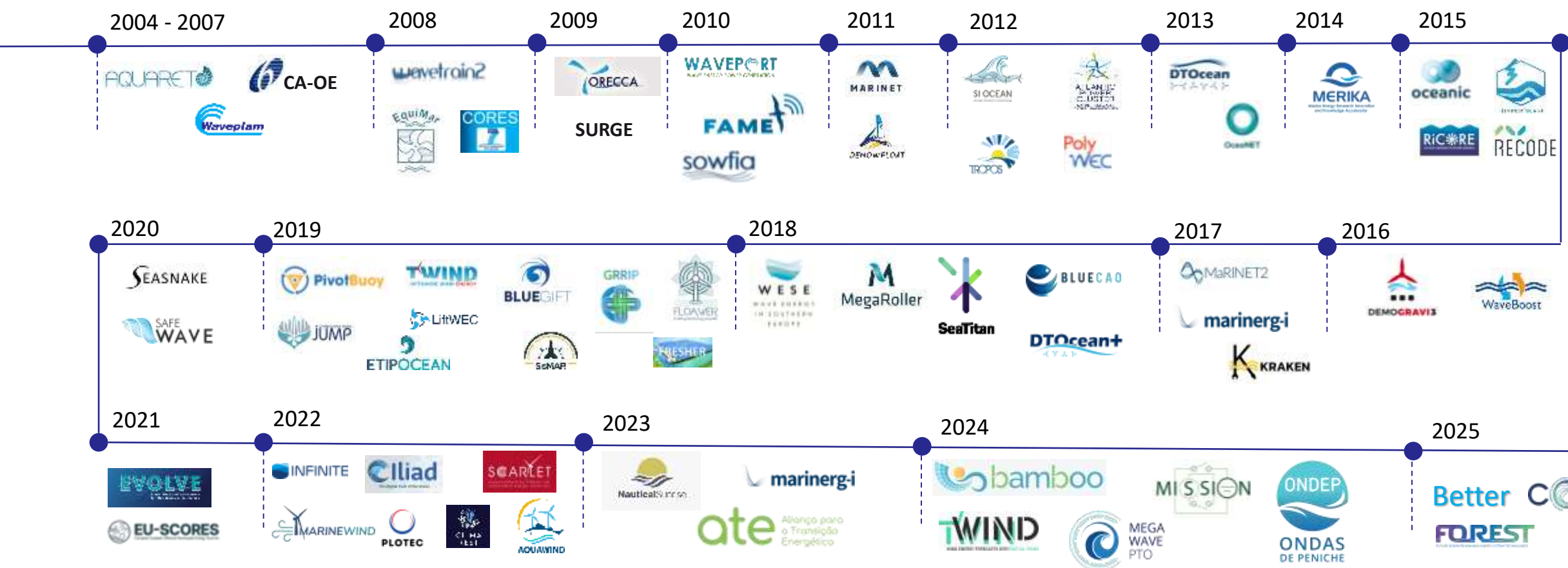
- **Supply chain analysis**
- Market analysis

- **Techno-economic modelling**
- Financial assessment to guide investment decisions

Clients & World Presence

More than 60 clients spread over 15 countries

Our projects



80 R&D Projects | €15M Funding | 250 Scientific Papers | 370 Partners of 30 Countries

WavEC
Offshore Renewables

MEGA WAVE PTO

Brief Introduction

MEGA WAVE PTO – General Information

Title: Modular Electrical Generator PTO System for Wave, MEGA PTO WAVE

Project ID: 101147321

Call: HORIZON-CL5-2023-D3-02, RIA, 'Development of innovative power take-off and control systems for wave energy devices

Agency: EUROPEAN CLIMATE, INFRASTRUCTURE AND ENVIRONMENT EXECUTIVE AGENCY, CINEA

Start: 1st May 2024

Duration: 48 months

EU grant: 2,105,638.08€ (Lump sum)

UK grant: 1,894,119.38€

Total: 3,999,757.45€

Funded by the European Union

UK Research and Innovation

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Context and Objectives of the Project

Challenges:

- High CapEx (e.g. Manufacturing, assembly, installation)
- Wave energy converters equipments are subject to a wide range of loads
- Power take-off systems do not present high average efficiency
- PTOs are prone to failures, leading to high O&M costs and longer downtime
- High Levelised Cost of Energy

Objectives

1. Demonstrate a fault tolerant all-electrical PTO, with tests at RWTH's facility.
2. Optimise System Performance and Survivability through Control Strategies for different operating conditions.
3. Reliability and Availability through Condition Monitoring Diagnostics.
4. Increase availability by 50% & reduce OPEX by 50%.
5. Use Recyclable Materials for Manufacturing.
6. LCOE reduction of 30-40%.
7. Establish an EU Supply Chain.

Characteristics of the MEGA WAVE System

- Axial flux magnetic gear
- Modular design by removal of iron from the stator
- Reduction of internal magnetic forces
- Lighter and simpler machine, avoiding heavy structural supports
- Eliminates cogging torque, improving efficiency and reducing vibrations
- The air-cored stator enables easy assembly, replacing and upgrading of modules
- Stackable modules offering scalability across diverse applications
- If a module is damaged the others keep working

Lump Sum Funding Scheme

- The lump sum scheme removes all obligations on actual cost reporting
- No need to report/present all invoices and time sheets, no financial statement audits
- Much less administrative burden
- EU payment is made at the end of each reporting period upon WP completion as described in the Grant Agreement
- A WP that is not fully finalised or rejected over a reporting period may be re-reported, validated, and paid in the context of a subsequent reporting
- Only during the final reporting will it be possible to indicate that a WP has been partially completed: in this case the EC will finance this WP proportionally and according to a declared and validated rate of achievement

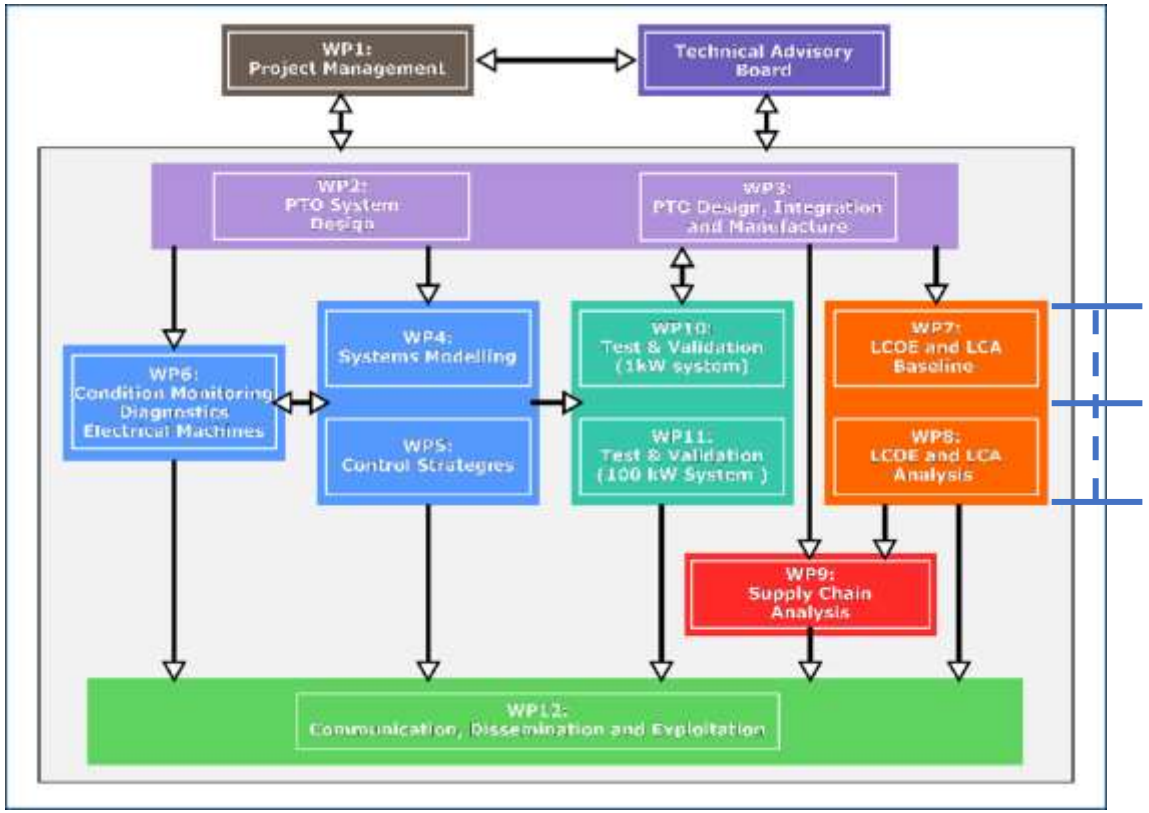
Proposal Stage: Work Package Structure

Since EU pays at the end of each reporting period upon WP completion, we should mind:

- WPs structure – it's acceptable that we split some WPs in two to anticipate part of the payment;
- WPs timeline – align the end of WPs with end of reporting period

$$Prefinancing = 1.6 \frac{TotalBudget}{Num.ofReportingPeriods}$$

2 Reporting Periods – 80% of prefinancing
3 Reporting Periods – 53% of prefinancing
In any case, EU keeps 5% for the Mutual Insurance Mechanism



MEGA WAVE PTO reporting periods:
M18, M36, M48
(recommended by the project officer in the grant agreement preparation)

Proposal Stage - Budget *(There is an Excel Macro to prepare the budget)*

List of Beneficiaries

List of beneficiaries and affiliated entities

Add BE | *! Double click buttons !* | Apply changes

BE/AE nr	BE/AE name	Acronym	Country	Funding rate		
BE1	University of Edinburgh	UEDIN	UK	100%		Add AE to BE1
BE2	Polytechneio Kritis	TUCRETE	EL	100%	Clear BE2	Add AE to BE2
BE3	Supply Design Limited	SDL	UK	100%	Clear BE3	Add AE to BE3
BE4	Cheros Srl	CHEROS	IT	100%	Clear BE4	Add AE to BE4
BE5	Perfezionamento S Anna	SSSA	IT	100%	Clear BE5	Add AE to BE5
BE6	Energia Offshore Associacao	Wavec/Offshore R	PT	100%	Clear BE6	Add AE to BE6
BE7	CGEN Engineering	CGEN	UK	100%	Clear BE7	Add AE to BE7
BE8	Aachen	RWTH AACHEN	DE	100%	Clear BE8	Add AE to BE8
BE9	Association Europeenne de l'Energie de l'Ocean	OEE	BE	100%	Clear BE9	Add AE to BE9
BE10	Mocean Energy Ltd	Mocean	UK	100%	Clear BE10	Add AE to BE10
BE11	Pure Marine Gen (Ireland) Limited	PureM	IE	100%	Clear BE11	Add AE to BE11
BE12	CETO Wave Energy Ireland Limited	CETO	IE	100%	Clear BE12	Add AE to BE12

List Of WPs

List of Work Packages

Add WP | *! Double click buttons !* | Apply changes

WP number	WP name	
WP1	WP1 Project Management	
WP2	WP2 PTO System Design	Clear WP2
WP3	WP3 PTO Design, Integration and Manufacture	Clear WP3
WP4	WP4 System Modelling	Clear WP4
WP5	WP5 Control Strategies	Clear WP5
WP6	WP6 Condition Monitoring Diagnostics	Clear WP6
WP7	WP7 LCOE & LCA Analysis Baseline	Clear WP7
WP8	WP8 LCOE & LCA Analysis	Clear WP8
WP9	WP9 Industrial Supply Chain Engagement & Analysis	Clear WP9
WP10	WP10 1kW Test & Validation	Clear WP10
WP11	WP11 100kW Test & Validation	Clear WP11
WP12	WP12 Communications, Dissemination & Exploitation	Clear WP12

Budget per WP per category

BENEFICIARY 6 - CALCULATION SHEET — View Summary — Wavec/Offshore Renewables

COST CATEGORY	UNITS	COST PER UNIT	BE TOTAL COSTS
COSTS WORK PACKAGE 1: WP1 Project Management			
A. DIRECT PERSONNEL COSTS			
A.1 Employees (or equivalent)			
SENIOR SCIENTISTS (or equivalent in the private sector)			0,00
JUNIOR SCIENTISTS (or equivalent in the private sector)			0,00
TECHNICAL PERSONNEL (or equivalent in the private sector)			0,00
ADMINISTRATIVE PERSONNEL (or equivalent in the private sector)			0,00
OTHERS			0,00
A.2 Natural Persons under direct contract			0,00
A.3 Seconded Persons			0,00
A.4 SME owners and natural person beneficiaries		4 282,44	0,00
B. DIRECT SUBCONTRACTING COSTS			
			0,00
C. DIRECT PURCHASE COSTS			
C.1 Travel and subsistence			0,00
C.2 Equipment (complete 'Depreciation costs' sheet)			
Equipment			0,00
Infrastructure			0,00
Other assets			0,00
C.3 Other goods, works and services			
Consumables			0,00
Services for meetings, seminars			0,00
Services for dissemination activities (including website)			0,00
Publication fees			0,00
Other (shipment, insurance, translation, etc.)			0,00
D. OTHER COST CATEGORIES			
D.1 Financial support to third parties (if applicable in the topic specific conditions)			0,00
D.2 Internally invoiced goods and services			0,00
D.3 Transnational access to research infrastructure unit costs (if mentioned as eligible in the topic specific conditions)			0,00
D.4 Virtual access to research infrastructure unit costs (if mentioned as eligible in the topic specific conditions)			0,00
D.5 PCP/PPI procurement costs (if mentioned as eligible in the topic specific conditions)			0,00
TOTAL DIRECT PERSONNEL COSTS AND PURCHASE COSTS (A+C)			0,00
TOTAL DIRECT COSTS (A+B+C+D)			0,00
E. INDIRECT COSTS (25% * (A+C))			0,00
F. TOTAL COSTS (A+B+C+D+E)			0,00
COSTS WORK PACKAGE 2: WP2 PTO System Design			
A. DIRECT PERSONNEL COSTS			
A.1 Employees (or equivalent)			
SENIOR SCIENTISTS (or equivalent in the private sector)			0,00
JUNIOR SCIENTISTS (or equivalent in the private sector)			0,00
TECHNICAL PERSONNEL (or equivalent in the private sector)			0,00
ADMINISTRATIVE PERSONNEL (or equivalent in the private sector)			0,00
OTHERS			0,00

Note: If ODC/Personnel > 15% we need to detail ODCs. Example: →

Any comments

	BE ref	WP ref	Comments
	BE6	8	2 travels for project meetings, 2 people each, 1400€ unitary value; 2500€ for open access publication

Consortium Agreement

There is a template of the consortium agreement for lump sum grants:
https://www.desca-agreement.eu/desca-model-consortium-agreement/desca-models/

- For Lump Sum Grants, the General Assembly is complemented by a Work Package Leaders Group;
- The WP Leader Group should monitor the percentage of work package completion per work package as well as per Party to be reported to the Granting Authority;
- The CA should include the procedure in case of non-completion of work: if the PO considers in the end of the project that a WP is just partially completed, the EU will transfer only an amount proportional to the percentage of completion; the CA define how this share is distributed by the partners

Periodic Report

The periodic report consists of 3 main elements:

- **Technical report:** part is filled in online and there is a Word template to use
- **Status of the work packages:** declare whether a WP is complete or incomplete
- **Financial statement:** automatically generated based on the status of WPs

The Technical Report should include:

- **Overall summary**
- **Level of completion**, relatively to the Grant Agreement:
  - project objectives
  - Deliverables
  - Milestones
  - WPs
- How the work is contributing to the Impacts
- **Communication and Dissemination** activities
- **Deviations** with respect to the GA

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MISSION

Brief Introduction

MISSION

MISSION – General Information

Project Name: e**MIS**sion-free HV and MV transmi**SION** switchgear for AC and DC

Project ID: 101135484

Call: HORIZON-CL5-2023-D3-01-12 – Development of MVDC, HVDC and High-Power Transmission systems and components for a resilient grid

Agency: EUROPEAN CLIMATE, INFRASTRUCTURE AND ENVIRONMENT EXECUTIVE AGENCY, CINEA

Start: 1st January 2024 **Duration:** 48 months

EU grant: 10,398,632.46€ **CH garant**: 623,394.63€ **UK grant:** 601,367.54€

Total: 11,623,394.63€

Funded by the European Union

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

UK Research and Innovation

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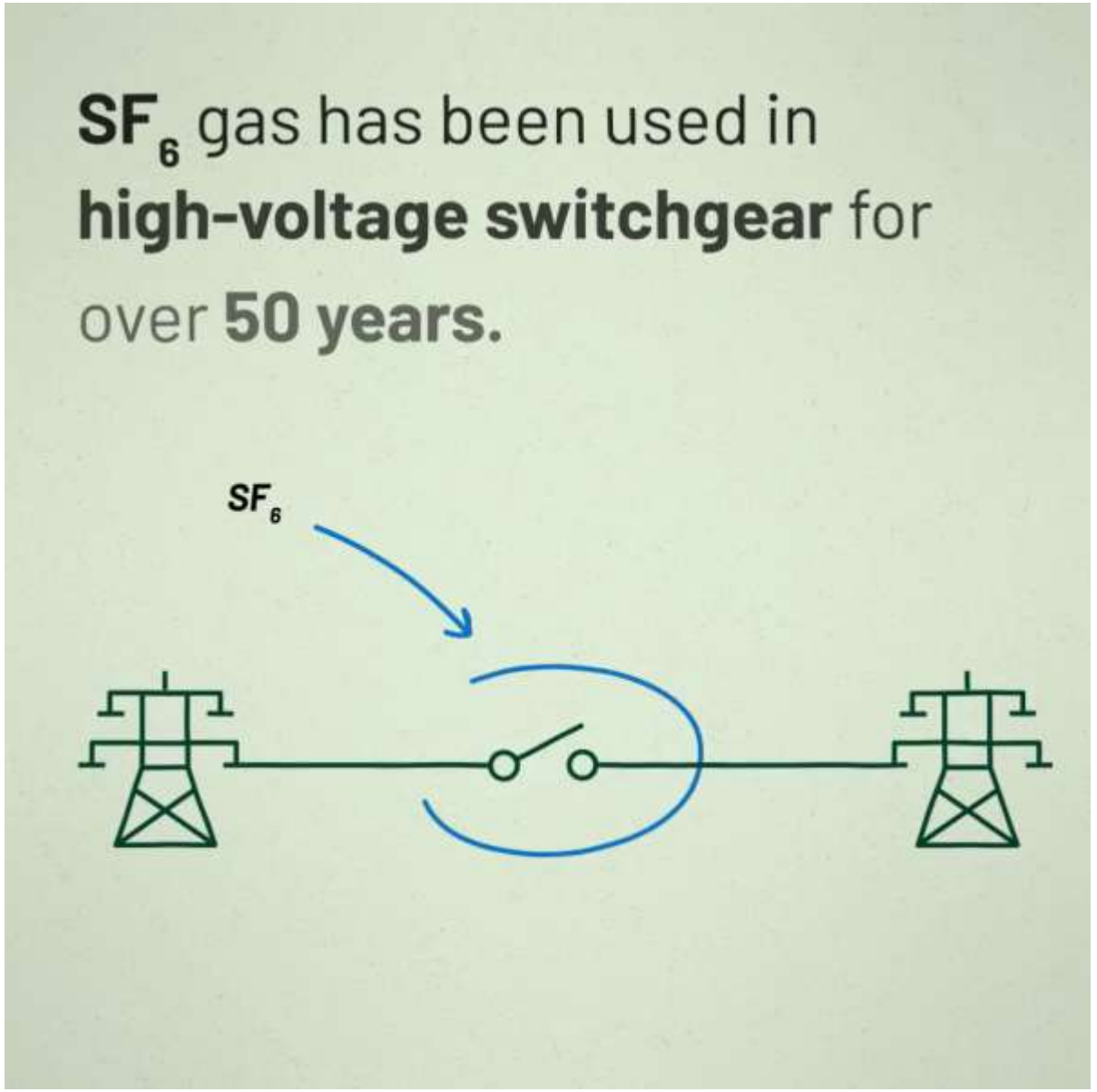
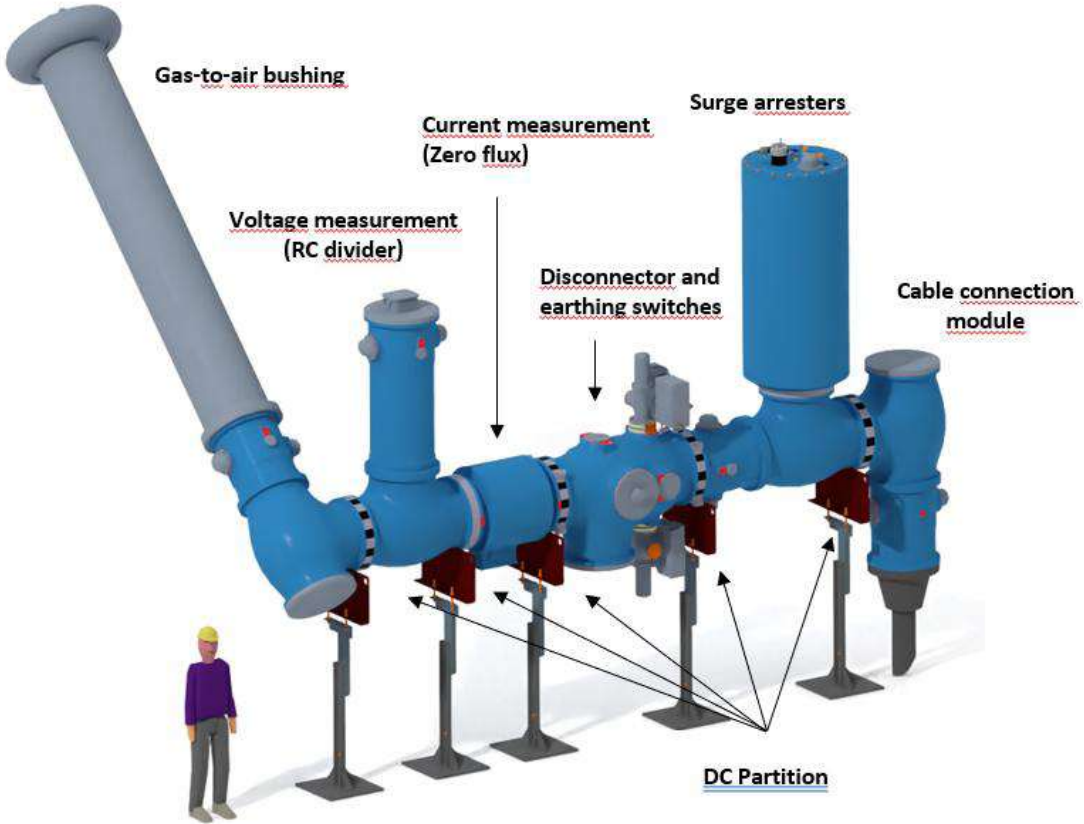
MISSION – Overview

- Sulfur hexafluoride (**SF_6**) is widely used gas in **High-Voltage** and **Medium-Voltage** circuit breakers.
- SF_6 has an extremely high Global Warming Potential (**GWP ≈ 24,300**)!
- Under the EU Green Deal -> **SF_6 will be phased out by 2032**
- Objectives:
  - ✓ To develop a **SF_6-free HVAC 420 kV circuit breaker**
  - ✓ To develop a **SF_6-free HVDC 550 kV GIS**
  - ✓ To develop a **SF_6-free MVDC 12 kV circuit breaker**

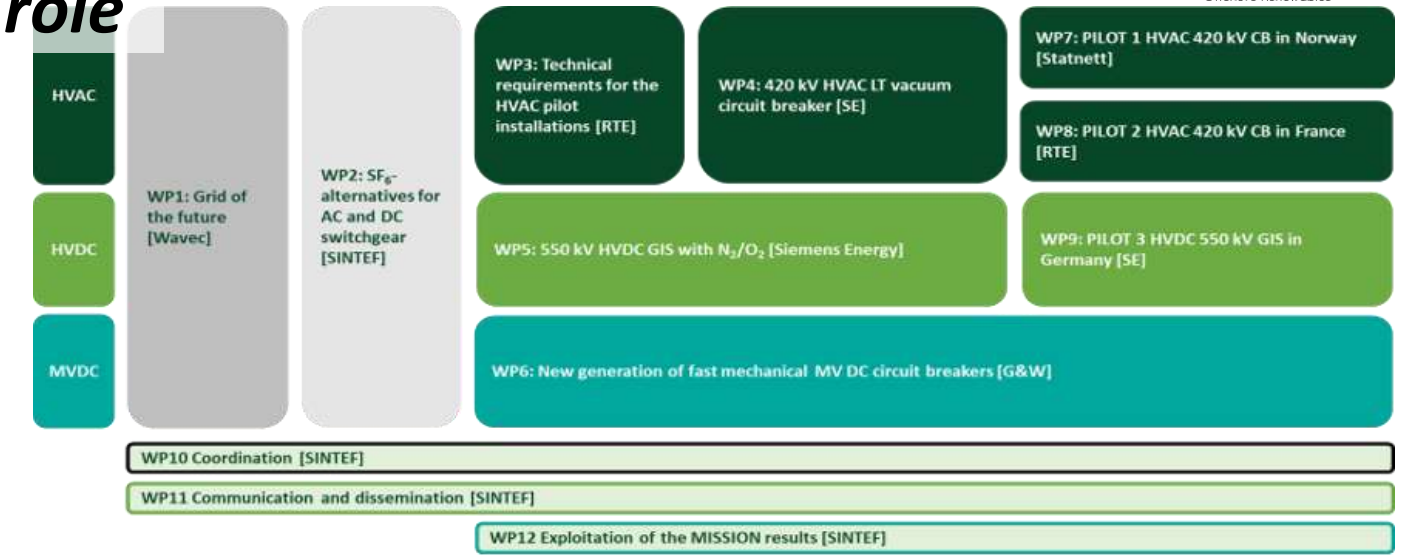


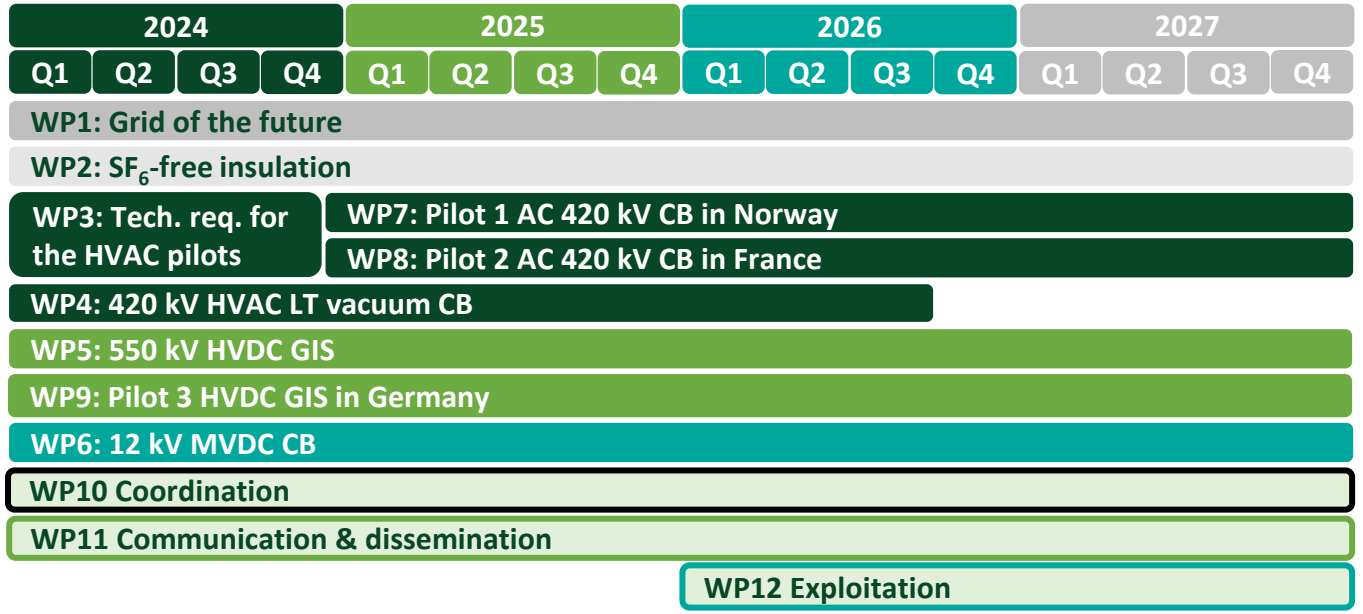
MISSION – Overview



MISSION – WavEC's role

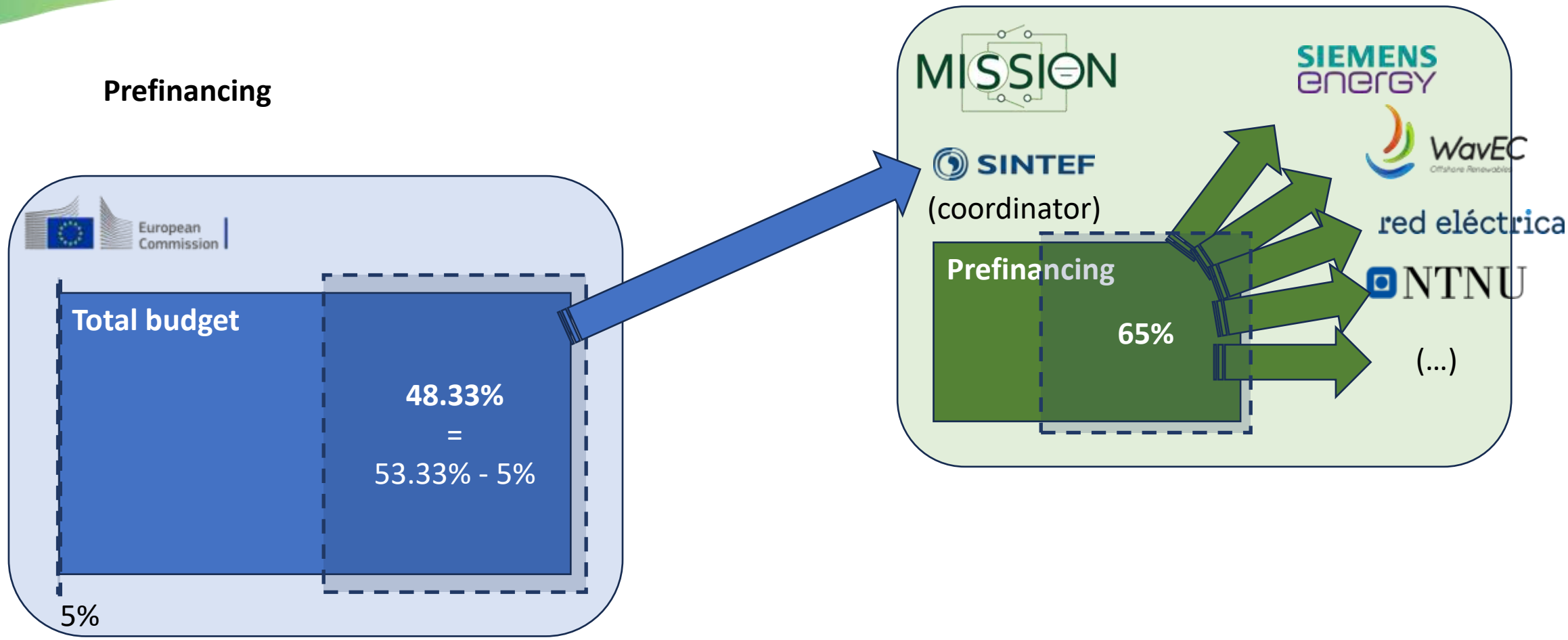
- **WP1:**
  - WP leader
  - Lifecycle Assessment
  - Lifecycle Costs
  - Environmental Impacts
  - Roadmap for the EU





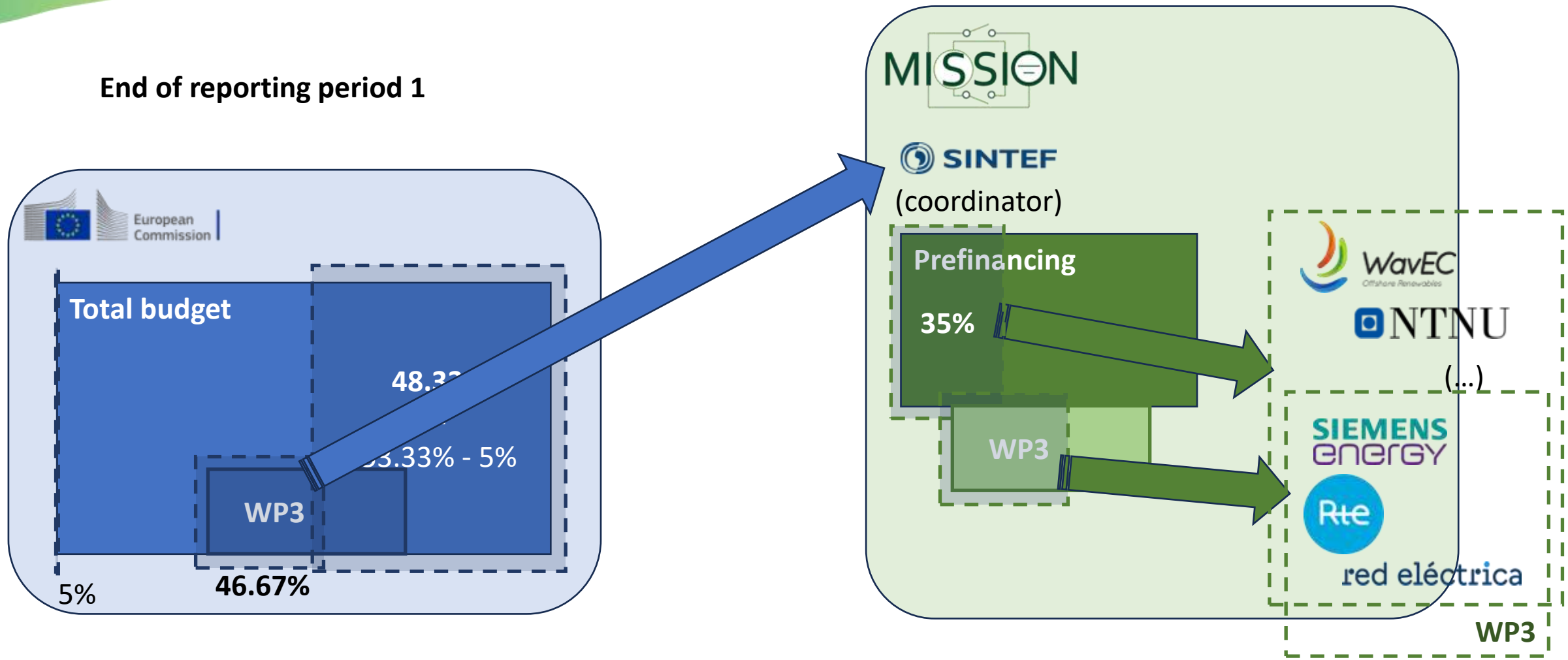
MISSION – Lump-Sum Experience

Prefinancing



MISSION – Lump-Sum Experience

End of reporting period 1



Conclusions

WavEC's feedback

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Conclusions – WavEC's feedback

- **<u>Much lower financial burden</u>** for beneficiaries
  - Particularly beneficial for smaller organizations
- Clear reporting of contributions **– specify who performed which tasks**
- Activities should closely **follow the Grant Agreement** and are carefully monitored
- As in actual-cost projects, **technical evaluations** are **thorough** and **detailed**
- Collaboration is valued and evaluated:
  - between project partners
  - across different Work Packages (WPs)

Questions?

Thank you

www.wavec.org

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MEGA WAVE PTO

(https://www.megawave-pto.eu)

MISSION

(https://euprojectmission.net)