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# Support to preparation of the first call for proposals under the Innovation Fund - methodologies for calculation of relevant costs and effectiveness of GHG emissions avoidance

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# 2. Relevant Costs draft methodologies

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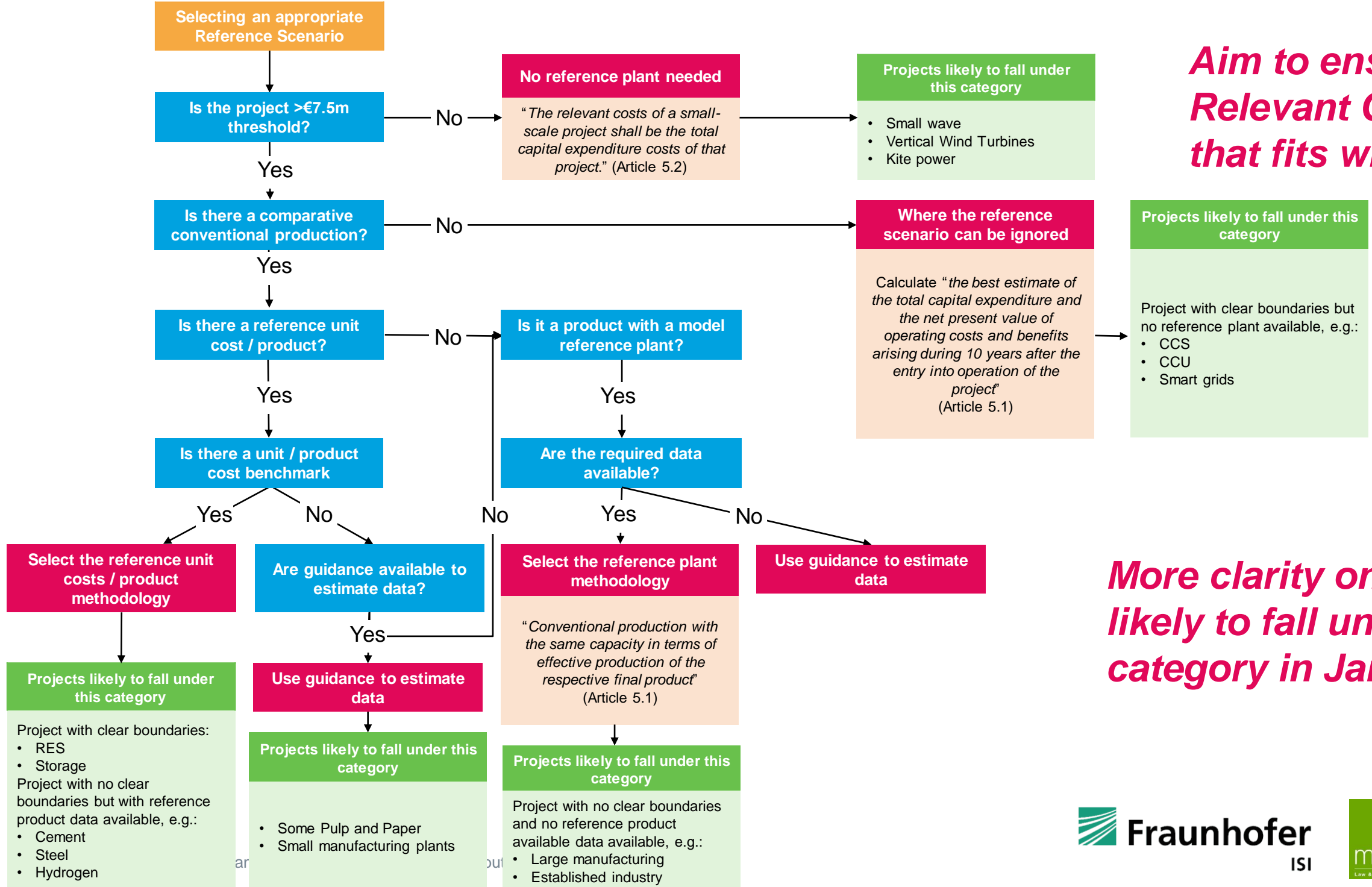
# Overview of this presentation

- **Context** – The IF Delegated Regulation introduced various conditions and parameters to underpin any calculation of Relevant Costs. It is now necessary to operationalise the Relevant Costs approach to enable it to adequately cover all project IF types.
- **Study objectives** – the ICF team is investigating a set of methodologies to ensure that project proponents can use workable Relevant Costs methodologies which adequately reflect their project type. These methodologies should also allow comparison across the IF's thematic areas.
- **Inputs** – Building on the “Reference Plant” approach to Relevant Costs, first deployed in the NER 300 programme, we have investigated a “Product-based” Relevant Costs approach using two projects from our shortlist of potential exemplar projects.

# Relevant Costs - ensuring clarity on definitions unique to the IF and coverage

- **Relevant Costs** – *“the additional costs that are borne by the project proponent as a result of the application of the innovative technology related to the reduction or avoidance of the greenhouse gas emissions.”* (Art. 5, IF Delegated Regulation)
- Typically based on analysis of CAPEX, OPEX + Operational Benefits during the first 10 years of a project’s life
- Relevant Costs calculations dependent on project type (see *draft Decision Tree*)

# Draft Decision Tree to aid Relevant Cost decisions



**Aim to ensure an appropriate Relevant Cost methodology that fits with all project types**

**More clarity on the projects likely to fall under each category in January**

# Parameters identified as impacting the selection of the appropriate reference scenarios

- Discreet **ring-fenced** project (e.g. greenfield renewables project) or an **embedded** process (e.g. retrofit to an existing plant);
- **Size** of the project – to understand whether the project fits into the small-scale project category of less than EUR 7.5 million;
- Existence of **reference product** – here it is recognised that in the vast majority of cases there will be some form of reference product;
- Availability of **reliable reference product price information** – this is required to inform the Relevant Costs calculation;
- Availability of **reliable reference product and/or plant cost data** to inform the Relevant Costs calculation; and,
- Existence of **reference plant** (which may or may not be available).

# Reference Plant Relevant Cost approach

## Key principles underpinning the approach

- Derivation of Relevant Costs is based on the presence of a counterfactual (Reference Plant), whereby funding costs are reduced by the costs of the counterfactual, leaving the additional 'innovative' costs of the project in scope of the Innovation Fund award.
- Under NER 300, a typical Reference Plant used for renewable energy projects was a Combined Cycle Gas Turbine (CCGT).
- Derivation is based on a formula that examines the difference in CAPEX, OPEX and Operational Benefits over 10 year period, i.e.:

$$\begin{aligned} & \text{Difference in CAPEX (between the demonstration plant and reference plant)} \\ & + \text{Difference in NPV of OPEX} - \text{Difference in NPV of Operational Benefits} \end{aligned}$$

## Example

	CAPEX (€ m)		OPEX (€ m, NPV)		Benefits (€ m, NPV)		
Demonstration Plant	240		35		40		
Reference Plant	180		20		32		
<i>Difference</i>	<i>60</i>		<i>15</i>		<i>8</i>		
<b>Relevant Costs</b>	<b>60</b>	<b>+</b>	<b>15</b>	<b>-</b>	<b>8</b>	<b>=</b>	<b>67</b>

- Relevant Costs → EUR 67m, therefore the maximum IF grant support is 60% of Relevant Costs → EUR 40.2m

## Application

- Based on the draft Relevant Costs Decision Tree, and the current product-based approach being taken by the study team, the aim is to limit the need for project proponents to rely on a Reference Plant approach.
- The study team will be examining the specific types of project where this approach is most likely to be required in January once we have reviewed the complete short list of projects and undertaken further research.



# Product-based Relevant Cost approach

- **Key principles underpinning the approach**
  - Where a reference plant is not clearly defined, nor is specific project data available, the end-product can be used as a reference for a comparative cost calculation:
    - In many industries there are accepted **long-term forward pricing forecasts** used for project funding (for example, the Levelised Cost of Energy (LCOE) in electricity production) OR
    - There is a **standardised per product cost benchmark** (as for example in Blast Furnace steel production).
- **Two worked examples:** one based on product price (power), the other on production costs for a material derived from carbon capture.

# Worked example #1: Wave Power – product price

- **Project** – grid-connected wave energy converter array demonstrator
- **Key inputs** – project proponent provided key project inputs which we have used as indicative financial indicators to test the calculation of Relevant Costs
- **These inputs include (but are not limited to):**
  - Capacity of the project
  - Project life
  - Capex cost
  - Variable annual opex
  - Fixed annual opex
  - Non-annual periodic costs
  - Decommissioning costs
  - Timing inputs

Key Project Inputs		
Date of financial close	31-Dec-20	
Construction		
capacity	1,500	kW
construction cost	8,000	EUR/kW
construction duration	8	quarters
Production and revenues		
project life	10	years
capacity factor	30.0%	
market price	50.0	EUR/MWh
percentage of PPA price realised	100%	
Indexation		
	2.00%	%
Operating costs - variable		
O&M	800	EUR/kW/year
feedstock	-	EUR/kW/year
total	800	EUR/kW/year
Operating costs - fixed		
fixed opex	600	EURk/year

# Worked example #1 : Wave Power

▪ **Calculations** – with the key inputs provided, the model then calculates the simple cashflows of the project over the defined operational timeframe, which can then be used to calculate the relevant cost for the project by using the following steps:

1. Calculate relevant **Weighted Average Cost of Capital (WACC)**
2. **Discount the OPEX** using the WACC
3. **Discount the actual energy produced using the same rate**, since we are creating a comparable flat nominal rate / tariff throughout the lifetime which we would discount if it were revenue
4. Use these totals to calculate the **LCOE**
5. **Calculate NPV of average realised tariff**
6. Use this to **calculate the LCOE to Realised Tariff Difference'** (i.e. based on difference between the all in cost (including funding cost) of a technology, and what it can earn by selling that output, expressed as a tariff difference (per unit)
7. Multiply the above by energy produced in first 10 years to calculate **Relevant Cost = EUR 37.9m**
8. Apply IF's 60% maximum intervention rate to Relevant Cost to derive **project's maximum grant award level = EUR 22.7m**

Relevant Cost Calculation						
LCOE				30 Sep 20	31 Dec 20	31 Mar 21
NPV of costs				n/a	n/a	(1,500)
Discount rate		1.96%	<i>per period</i>			
Discount factor			1	1.000	1.000	0.981
Discounted costs		23,545		-	-	(1,471)
Energy produced discounted (from Mar 23)		23,261		-	-	-
LCOE		1.01	EUR/kWh			
NPV of realised tariff		1,163		-	-	-
Benefit		0.05	EUR/kWh			
Tariff gap		0.96	EUR/kWh			
First 10 years of production	10	31 Dec 32		-	-	-
Total energy produced			MWh	39,420		
Relevant Cost			EURk	37,930		
Maximum Innovation Fund Grant Award	60.0%		EURk	22,758		

# Worked example #2: Industry – product substitution

- **Project** – industrial facility producing a substitute product from carbon capture in order to replace an alternative in the market.
- **Key inputs** – same process as for renewable energy projects, proponents provide the key inputs.

Key Project Inputs			
Date of financial close		31-Dec-20	
Construction			
capacity		100,000	tpa
construction cost - 2019 prices		350	EUR/ton
construction duration		4	quarters
indexation rate		2.00%	%
Production and revenues			
project life		20	years
Operating costs - general			
O&M - percentage of capex		3.00%	%
operating costs indexation rate		2.00%	%
Operating costs - variable			
total		3	EUR/ton/year
Operating costs - fixed			
labour		500	EURk/year
electricity & heat		1,500	EURk/year
admin/other fixed costs		50	EURk/year
total		2,050	EURk/year

# Worked example #2 : Industry

- **Calculations** – again a similar process is used to calculate the Relevant Cost, with the following differences to renewable energy projects:

1. Instead of calculating an LCOE, it calculates a **discounted cost per unit of production**
2. Proponents also provide the **cost per unit of production for a comparable product**
3. Calculate the **difference between the reference product cost of production (35 EUR/ton) and the cost calculated by the model (77.87 EUR/ton) = 43 EUR/ton**
4. Multiply the above by the number of units produced in the first 10 years to calculate **Relevant Cost = EUR 42.9m**
5. Apply IF's 60% maximum intervention rate to Relevant Cost to derive **project's maximum grant award level = EUR 25.7m**

Relevant Cost Calculation							
				30 Sep 20	31 Dec 20	31 Mar 21	30 Jun 21
Total costs				n/a	n/a	(9,104)	(9,104)
Discount rate	7.73%	per year	1.88%	per period			
Discount factor			1	1.000	1.000	0.982	0.963
Discounted costs		74,465		-	-	(8,936)	(8,771)
Production discounted		956,332		-	-	-	-
Discounted cost per unit		77.87	EUR/ton				
Comparable unit cost		35	EUR/ton				
Additional costs		43	EUR/ton				
First 10 years of production	10	31 Dec 31		-	-	-	-
Total product produced			tons	1,000,000			
Relevant Cost			EURk	42,866			
Maximum grant	60.0%		EURk	25,719			

# Ensuring the methodologies are usable by both project proponents and evaluators

- **Our work to date has led to the following conclusions for progressing the workstream**
  - ❑ **Indexation** (i.e. adjusting CAPEX / OPEX by inflation over the project period) – project proponents to provide their rate, but following guidance which refers to a country-specific inflation rate.
  - ❑ **Comparable product prices** – project proponents to state the costs of the comparable component (NB as they are assessed on cost efficiency this should not be open to exploitation). Guidance to evaluators on how they should check this.
  - ❑ **Product and cost benchmarks** – reference a few examples as illustrations across a few sectors in the guidance.
  - ❑ **WACC assumptions** – allow project proponents to supply a WACC based on their company, provide guidance on exceptions, e.g. for SMEs. This is the approach in assessing State Aid.
  - ❑ **Missing financials** – many projects we have shortlisted do not yet have project financials (many are too early stage to apply yet for the IF, but could potentially benefit from Project Development Assistance – PDA). We intend to simplify the financial details to 5-6 key elements to achieve a model that can be used by all project proponents, e.g. CAPEX, variable costs and fixed costs, etc. This will be translated into the final calculation tool/sheet.
    - The calculation tool will be a good determinant for whether a project is able to break down these costs.
    - However, even if the project lacks maturity (and might require PDA to make it bankable), the calculation tool will still allow the generation of the Relevant Costs.

# 3. State aid considerations around cumulation of IF with other funds

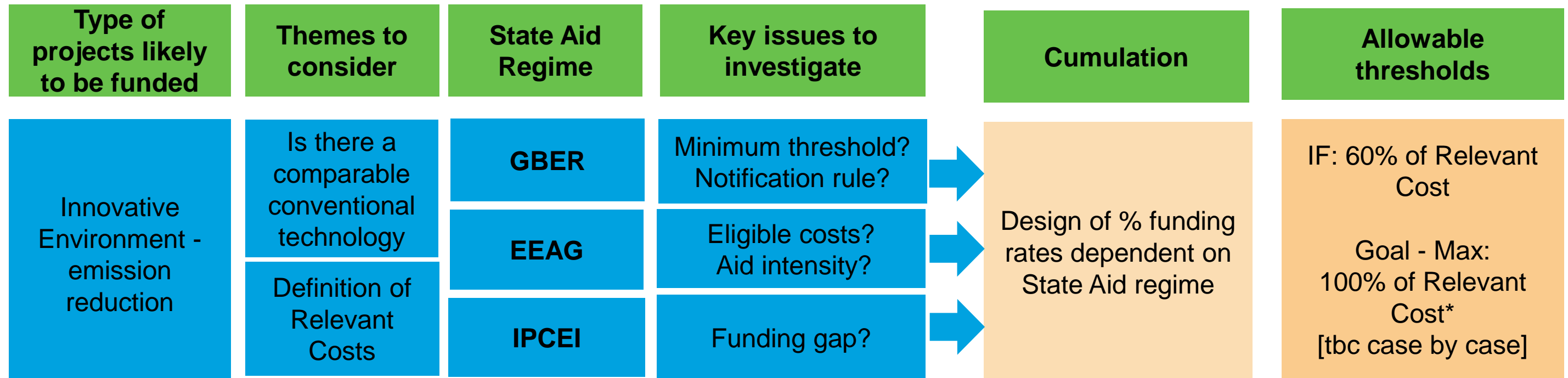
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# Overview

- **Context** – IF supports innovative low-carbon technology projects for achieving EU climate objectives. IF Relevant Costs calculation provides the framework to combine the IF support of up to 60% of the Relevant Costs with the remaining 40% that the IF cannot support from State Aid, in order for projects to become more financially viable.
- **Study objectives** – To investigate the legal aspects of blending IF with State Aid support scheme funding, mainly using three sources: the General Block Exemption for State aid (GBER); State Aid for Energy & Environmental Protection (EAEG) and for Important Projects of Common European Interest (IPCEI)
- **Key rules to consider regarding Relevant Costs under Innovation Fund**
  - Max 60% of CAPEX, OPEX + Operational Benefits (i.e. Revenues) during first 10 years of project's life.
  - Follows the principle of additionality: cover costs & revenues - compared to a conventional reference technology (i.e. funding costs are reduced by the costs of the counterfactual). This is the similar approach used for State Aid.
  - Aim is to ensure the funding of 100% of Relevant Costs, so covers 40% of the same Relevant Costs from State Aid
  - Operating revenues (under the Relevant Costs calculation) do not include State Aid under IPCEI or EAEG
- **The cumulation depends on the eligible costs, aid intensity and notification thresholds of the State Aid regimes being examined.**



# State Aid Decision Tree – covers all projects, but most suited scenario depends on project and cumulation approach



*A more elaborated Decision Tree will now be developed*

*We will illustrate the Guidance for project proponents with potential illustrative examples*

# Three State Aid regimes were investigated

- **General Block Exemption Regulation for State aid (GBER)**
  - Aid for activities/measures considered to have incentive effect – related to EU objectives
  - Considered compatible with internal market
  - No notification is needed
  - Applies to measures over certain investment cost thresholds – dependent on the project type
  - Cumulation is possible if the total amount of public funding in relation to the same eligible costs does not exceed the most favourable funding rate of EU law
  - Aid intensity – dependent on the project type
- **EEAG: Extra investment cost (CAPEX) directly linked to the environmental protection objective (separate investment or counterfactual)**
  - Notification is needed over certain thresholds
  - The eligible costs for environmental aid are the extra investment costs which are directly linked to the achievement of the common objective
  - Aid intensities are determined by project type – higher aid intensities might be justified where eco-innovation addresses market failure and higher risks of innovation and the environmental objective
  - Cumulation of aid is possible provided that the aid does not exceed the limits fixed in the Guidelines
- **Important projects of Common European Interest (IPCEI)**
  - Project representing an important contribution to the Union’s objectives – quantitatively and qualitatively
  - where the beneficiary provides co-financing of major innovative nature or enabling deployment of new product or service with high innovation
  - Eligible costs – also defined re counterfactual (i.e. the costs of alternative project)
  - Aid intensity may be up to 100% of the funding gap

# Rules on eligible costs vary across regimes

## ■ **GBER: mostly Investment costs**

- Aid for innovation clusters: 50% of the eligible costs = investment costs + operating costs for 10 years;
- Aid for environmental protection: 40% of the extra investment cost to go beyond EU standards for environmental protection or to increase the level of protection (separate investment or re to a similar less environmental investment that would be carried out without the aid);
- Energy efficiency measures: 30% of the extra investment costs to achieve higher level of energy efficiency (separate inv. or counterfactual);
- Energy efficiency in buildings: overall costs of the energy efficiency project, to leverage min 30% additional investment from private investor;
- Highly efficient cogeneration: 45% of extra investment costs for equipment for the installation to be high efficient compared to conventional installation;
- RE electricity production for new installations (excl food-based biofuels or hydro not complying with WFD): 45% of extra investment costs (separate investment or counterfactual) and Promotion of RE electricity production: operating costs in a competitive bidding process until the plant has been fully depreciated;
- Waste recycling and re-utilization: 35% of extra investment costs for more efficient recycling or re-use activities compared to conventional;
- Energy infrastructure: investment costs not exceeding the difference between investment costs and operating profit of the investment;

## ■ **EEAG: Extra investment cost (CAPEX) directly linked to the environmental protection objective (separate investment or counterfactual)**

- Waste management: 35%-45%-55%
- RE: 45%-55%-65% ] – 100% if bidding process
- EE: 30-40-50%
- Energy infrastructure or CCS: 100%

## ■ **IPCEI**

- Eligible cost (CAPEX and some OPEX) based on the counterfactual (alternative project)
- Max aid re the funding gap of eligible cost up to 100%: positive + negative cash flow over the investment lifetime – current value discount factor incl % of return.

# Notification thresholds

## ■ **GBER:**

### ■ **No Notification required if aid is below the following thresholds:**

- Risk finance aid below EUR 15 million per eligible undertaking
- for aid for innovation clusters: EUR 7.5 million per cluster
- for investment aid for environmental protection: EUR 15 million per undertaking per investment project
- for investment aid for energy efficiency projects: EUR 10 million
- for operating aid for the RE electricity production and operating aid for the promotion of RE in small scale installations: EUR 15 million per undertaking per project. When the aid is granted on the basis of a competitive bidding process: EUR 150 million per year taking into account the combined budget of all schemes;
- for investment aid for the district heating or cooling distribution network: EUR 20 million per undertaking per investment project
- for investment aid for energy infrastructure: EUR 50 million per undertaking, per investment project

## ■ **EEAG:**

### ■ **No Notification required for aid below fix thresholds and there (and with competitive bidding process):**

- Investment aid: EUR 15 million per undertaking
- Energy infrastructure: EUR 50 million per undertaking
- CCS: EUR 50 million per investment project

## ■ **IPCEI definition:**

- **No notification needed – projects selected at EU level**

# Thank you



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