



# REGATRACE

Renewable Gas Trade Centre in Europe

## D7.1 | Project Evaluation Plan

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## REGATRACE in a nutshell

**REGATRACE** (REnewable GAs TRAdE Centre in Europe) aims to create an efficient trade system based on issuing and trading biomethane/renewable gases Guarantees of Origin (GO) with exclusion of double sale.

This objective will be achieved through the following founding pillars:

- European biomethane/renewable gases GO system
- Set-up of national GO issuing bodies Integration of GO from different renewable gas technologies with electric and hydrogen GO systems
- Integrated assessment and sustainable feedstock mobilisation strategies and technology synergies
- Support for biomethane market uptake Transferability of results beyond the project's countries

The network of issuing bodies will be established by including existing national biomethane registries (Austria, Denmark, Estonia, Finland, France, Germany, The Netherlands, Switzerland and UK) and by creating issuing bodies in the Target countries of the project (Belgium, Ireland, Italy, Lithuania, Poland, Romania and Spain).

Moreover, REGATRACE will prepare the ground for setting-up national biomethane registries in other 7 Supported countries (Croatia, Czech Republic, Greece, Latvia, Slovenia, Sweden and Ukraine).

Using a participatory process involving several stakeholders, REGATRACE will develop strategic visions and national roadmaps to boost the biomethane market.

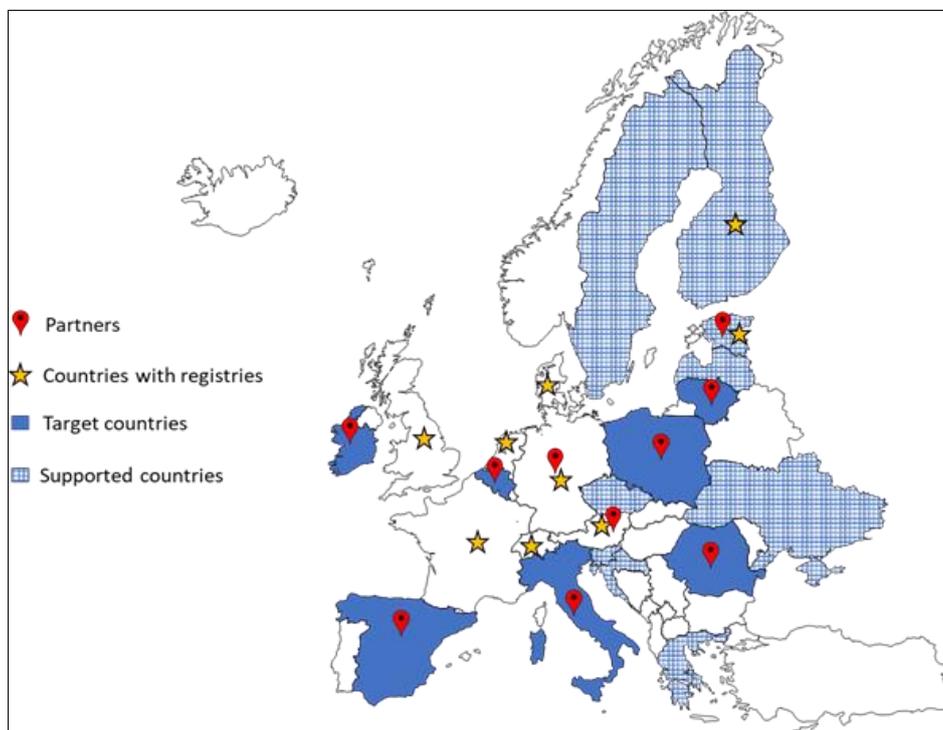


Figure 1: REGATRACE countries and partners

## 1 Introduction and structure of the document

Within WP7 – “*Evaluation analysis and policy recommendations*” activities and outcomes of REGATRACE project will be monitored and an assessment of the impacts achieved against the initial expectations will be carried out. In addition, the policy dimension will be examined in order to provide the ground for recommendations to be addressed to decision-makers, industry, authorities and all the key players in the biomethane value chain.

The evaluation process in REGATRACE is carried out step-by-step under the management of the *Project Evaluation Plan (D7.1)*, with the aim to determine the project’s effectiveness by tracking progress towards objectives and results achieved.

Within the Project Evaluation Plan the full set of practices and sequences of activities to be carried out are outlined along with the list and description of the evaluation criteria to be adopted. More specifically, this document provides a comprehensive evaluation framework with clear and straightforward:

- Description of **activities, outcomes and processes** to be **monitored** and analysed;
- Definition of **indicators** necessary for the **calculation of impacts** on the environment and biomethane market (directly or indirectly linked to REGATRACE activities);
- Formulation of a set of **criteria for the identification of the most successful policies** and measures for the promotion of biomethane sector and for the development and support of a common European biomethane market uptake;
- Set up of a methodology for **the estimation of the Replication potential** of biomethane policies/measures/incentive schemes/etc.

The document is organised according to the following structure:

- Chapter 2, “Evaluation in REGATRACE”;
- Chapter 3, “Monitoring of project activities”
- Chapter 4, “Process Evaluation”;
- Chapter 5, “Impact Evaluation”;
- Chapter 6, “Policy Evaluation and Replication Assessment”.



## 2 Evaluation in REGATRACE

Evaluating a project means performing a rigorous analysis to determine the relevance and fulfilment of objectives, activities, effectiveness, impact and sustainability and to verify whether the project has produced the planned results, delivered the expected benefits, and made the desired changes. An evaluation should also provide information that is credible and useful, enabling the incorporation of lessons learned into the decision-making process.<sup>1</sup>

Generally, evaluation is also instrumental in:

- Providing key stakeholders with the information needed to guide the project strategy towards achieving goals and objectives;
- Providing early warning of activities and processes that need corrective actions;
- Helping empower project partners by creating opportunities for them to reflect critically on the project's direction and decide on improvements;
- Building understanding, motivation and capacity amongst those involved in the project;
- Assessing progress to enable reporting requirements to be met;
- Assessing distribution of benefits among different beneficiaries and other target groups;
- Continuously improving project technical work and partners cooperation.



As a process, project evaluation takes a series of steps to identify and measure the outcomes and impacts resulted from project completion. Therefore, an ex-ante evaluation will be performed within this Project Evaluation Plan, followed by a mid-term assessment of progresses, to be delivered through the Interim Technical Report (M20). Finally, towards the end of the project, an ex-post evaluation will be carried out in order to compare the results achieved with the initial expectations and to assess the entire process carried out.

Evaluation in REGATRACE has two main objectives:

- To assess the success of the project by **monitoring** all the activities and outputs and analysing the **process** behind the achievement of them
- To assess the evolution of some key indicators in the project countries, in order to observe the **impact of national policies** and measures and follow the developments in the set up and run of national registries.

According to that and further elaborating the work done in BIOSURF<sup>2</sup>, REGATRACE evaluation activities are structured as follow:

- **Monitoring of project activities**

Monitoring generally means to be aware of the state of a system and to observe any potential or effective change that may occur over time. Concretely, it refers to the process of keeping track of all project-related activities and outputs oriented at the identification of potential problems in order to

<sup>1</sup> OECD, *Evaluation Guidelines* ( [https://www.oecd.org/dac/evaluation/seco\\_guidelines.pdf](https://www.oecd.org/dac/evaluation/seco_guidelines.pdf) )

<sup>2</sup> BIOSURF is a H2020 project financed by INEA. BIOSURF Evaluation methodology and results are reported in the [Project Evaluation Plan](#) and in the [Report on Impact Analysis](#).

be able to undertake the necessary corrective actions to ensure that the project remains within its scope. This is exactly what REGATRACE evaluation will do over the entire project duration, thanks to the contribution and participation of the project partners (Chapter 3).

- **Process Evaluation**

Process evaluation is complementary to monitoring. Whilst the latter finds out if and to what extent certain results have been achieved, the former allows understanding how and why those results have, or not, been attained.

In synergy with “Monitoring”, the rationale behind the achievement of the project results will be deepened in order to help current stakeholders and future parties interested in similar areas to



Figure 2: Evaluation in REGATRACE

REGATRACE understanding what sort of methods are likely to achieve the best results for a given action. In this regard, questionnaires will be distributed to key national stakeholders to assess some outputs of REGATRACE (e.g. key deliverables). Moreover, Process Evaluation will closely follow the activities carried out in WP6 (“Support for biomethane market uptake”) by keeping track of the process of participatory foresight that will be carried out in REGATRACE countries and assessing the results from a qualitative point of view (Chapter 4).

- **Impact Evaluation**

This is the first topic that most people think of when evaluation is mentioned. An impact evaluation provides information about the impacts produced by an intervention - positive or negative, intended and unintended, direct and indirect. It comprises the work done to measure the results of the project and allows to

compare them with the ambition of the project prior to the project start. In REGATRACE, a quantitative estimation of some selected parameter will be formulated and carried out with the objective to monitor and update the state of play of the biomethane sector as well as the status of development of national registries in the REGATRACE countries (Chapter 5).

- **Policy Evaluation**

With Policy evaluation, the effects of the European and national policies are examined and assessed in terms of necessity, efficiency, validity, etc. to improve the planning and implementation process. A set of criteria for the analysis of the most relevant policies on biomethane adopted by the different project countries will be defined in this Project Evaluation Plan and results will be reported in the Final Evaluation Report (M35). This analysis will be complemented by a “Replication Assessment” with the ambition to identify the most promising policies/measures that could be best replicated elsewhere (Chapter 6).

In the following chapters, a comprehensive and in-depth overview of how evaluation in REGATRACE works is extensively provided.

## 3 Monitoring of project activities

REGATRACE is built on the following main pillars which constitute the backbone of the project:

1. Establishment of European biomethane/renewable gases GoO system
2. Set-up of national GoO issuing bodies
3. Integration of GoO from different renewable gas technologies with electric and hydrogen GoO systems
4. Integrated assessment of sustainable feedstock mobilisation strategies and technology synergies
5. Support for biomethane uptake
6. Transferability of results beyond the project's countries



Therefore, specific objectives have been established and a number of outputs will be produced accordingly in order to achieve those targets. The following table (Table 1) reports the REGATRACE specific objectives and outputs, listed by work package.

REGATRACE project outputs (last column) will be monitored throughout the duration of the project: a mid-term update will be provided within the Interim Technical Report (M20) and the final results will be reported in the Final Evaluation Report (D7.2) (M35).

Table 1: REGATRACE Monitoring Table

WP	Specific Objective	REGATRACE Expected Outputs	Status
WP2	Establish the network of the national issuing bodies.	MoU signed by 7 target countries.	
	Determine the content and attributes of GoO	REGATRACE definitions on EBGOS formulated and proposed to the CEN standard expert group as support to define content and attributes of GoO.	
	Establish communication interfaces between the hub and the participating national GoO issuing bodies	<ul style="list-style-type: none"> <li>- Hub has been established and respective</li> <li>- processual, administrative, technical and organizational requirements for the hub have been elaborated.</li> <li>- ERGaR and AIB Systems and their compatibility have been reviewed.</li> <li>- Established Biomethane Registries/Issuing bodies are connected to the hub via the established communication interface.</li> <li>- Specifications and review of different technical solutions to provide a communication dashboard have been elaborated.</li> </ul>	
	Definition of tender procedure for the supply of hub and trading platform IT-services.	Guidelines for tender process of IT-services related for the hub and the trading platform are developed.	

<b>WP3</b>	Set-up of national/regional biomethane registries in the target countries.	1 biomethane registry for each target country.	
<b>WP4</b>	Coordination between the renewable electricity, biomethane/renewable gas and hydrogen certification systems.	<ul style="list-style-type: none"> <li>- Conversion scheme from renewable electricity into biomethane;</li> <li>- Design study for a coordinated conversion process.</li> </ul>	
<b>WP5</b>	Assessment of quantitative potential of promising and competitive production capacities for renewable gases in the different countries of the project.	Identification of at least 1 hot spot region in each country of the REGATRACE project for the future implementation of renewable methane technologies.	
	Definition of sustainability certification criteria, methodology, administrative issues and development of recommendations to remove administrative barriers.	Development of Guidelines on Sustainability Certification for Power-to-methane products in close cooperation with stakeholders.	
<b>WP6</b>	Create national visions and roadmaps for renewable gases market development.	<ul style="list-style-type: none"> <li>- Participatory workshops for target and supported countries;</li> <li>- 1 Strategic vision and 1 roadmap for each target and supported country.</li> </ul>	
	Provide practical assistance to project developers	Guidance for feasibility analyses and guidebook on securing financing for biomethane investments.	
<b>WP8</b>	Transferability of results beyond the project's countries.	Promotion of REGATRACE results outside the project community, by organizing 7 workshops in countries interested in the project (BG, HU, LU, NO, PT, RS and SK) and by regularly exchanging products, news and fact related to the project and the renewable gas world in general.	

Towards the end of REGATRACE, some key outputs listed above will be assessed through specific questionnaires and focused evaluation forms in order to get validation and gather useful feedback from the relevant stakeholders of the biomethane community (business, industry, decision makers, etc.). This activity is part of the Process Evaluation and details are reported in the next chapter.

### 4 Process Evaluation

As mentioned above, while the purpose of Monitoring is to verify the status and identify if a specific project output is achieved or not, Process Evaluation is necessary to understand what problems may have hindered a specific work package activity or, on the contrary, to assess the main factors that stand behind the success of another, e.g. the set-up and establishment of biomethane registries, the organization and outcomes of an event in a specific REGATRACE country, etc.



On the other hand, process evaluation will closely follow *roadmapping* activities in WP6 where a specific evaluation framework will be applied in order to assess the success of this participatory approach.

Thus, Process Evaluation will address the following activities:

- Assessment of key outputs
- Assessment of participatory *roadmapping* activities in WP6.

#### 4.1 Assessment of key outputs

An assessment of the key outputs of REGATRACE will be performed with the help of WP leaders and all those partners responsible for the selected activities.

In some cases, a list of deliverables, properly chosen, developed in WP2, 3, 4, 5 and 6 (guidelines, methodologies, proposals, letters of agreements, etc.) will be assessed through specific questionnaires and focused evaluation forms that will be distributed in due time during the Target workshops (WP1), participatory workshops (WP6) and circulated among key national stakeholders and experts from the countries covered by the project.

In Table 2, the list of potential deliverables to be subjected to Process Evaluation is reported.

Results of this activity will be reported in D7.2.

Table 2: REGATRACE deliverables to be assessed

WP	Deliverable N°	Deliverable Name	Delivery Date
WP2	D2.2	Report on content and attributes of GoO	M9
WP3	D3.1	Guidelines for establishing national biomethane registries	M4
WP4	D4.1	Guidelines for the verification of cross-sectoral concepts	M18
	D4.3	Harmonised set of rules for the conversion of electricity to biomethane/renewable gas and hydrogen GoO	M28
WP5	D5.3	Guidelines on renewable gas sustainability certification	M33
WP6	D6.2	Guidebook on securing financing for biomethane investments	M16

	<b>D6.4</b>	Guidance for feasibility analysis	M32
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#### 4.2 Assessment of *roadmapping* process in WP6: estimating the level of cooperation in the Biomethane Working Group

REGATRACE will support the uptake of biomethane market in the Target (BE, ES, IE, IT, PL, LT and RO) and Supported (HR, CZ, EE, FI, EL, LV, UA and SI) countries with the set up and run of a participatory process aimed at the elaboration of medium - long term strategic visions and consequent definition of national roadmaps towards a future biomethane development in each of the country involved.

This process is structured in 4 participatory workshops to be organised in each country (in national language) with the participation of the key national stakeholders of biomethane sector.

*Table 3: Participatory Workshops (T6.2)*

Workshop	Purpose	Indicative Month
Kick-off WS: Vision	The REGATRACE project and the mapping exercise (T6.1) will be presented with the aim of filling eventual gaps and collecting inputs to define the long-term strategic vision for biomethane.	Between February and May 2020 at the latest in all countries
2 <sup>nd</sup> WS: Roadmap	The draft strategic long-term vision will be presented, discussed and consolidated with stakeholders while collecting the first ideas and inputs for the definition of the national roadmap for biomethane.	Between October and December 2020 at the latest in all countries
3 <sup>rd</sup> WS: Guidance for feasibility analysis	Presentation of the national roadmaps further elaborated after the previous WS and discussion of the Draft Guidance for feasibility analysis, in order to collect inputs for the preparation of the country-tailored guidance.	Between March and May 2021 at the latest in all countries
4 <sup>th</sup> WS: Final results and lesson learned	Summing up the entire process with results achieved and presentation of the country-tailored guidance for feasibility analysis.	Between October and December 2021 at the latest in all countries

The aim of process evaluation here is to assess **the process of cooperation** toward the definition of the **visions** and **the** development of the **roadmaps** in the target and supported countries.

According to the activities foreseen in task 6.2, the first step of this process is to identify and involve a number of key national stakeholders in dedicated **Biomethane Working Groups**. The aim of this group is to open and maintain a communication channel across the different stakeholders and main players of the biomethane sector, with the ambition to work together in an integrated manner towards the definition of a common strategy.

To assess the effectiveness and proper functioning of this working group the level of cooperation internally perceived was assumed as key indicator.

According to literature, the term *cooperation* is related to “the actions of someone who is being helpful by doing what is wanted or asked for” or “people working together to achieve results” and moreover “an interaction between organisms that is largely beneficial to all those participating”. Despite all the different connotations related to this term, we can generally assume that cooperation is about **working together with a common purpose and toward a common benefit.**

According to that, a specific methodology for estimating the **perceived level of cooperation** among the members of the Biomethane Working Groups has been created in order to assess the roadmapping process in REGATRACE, with the general assumption that a high level of cooperation in the group can positively influence this work.

To best assess the level of cooperation, six indicators have been defined:

- 1) Leadership
- 2) Balanced Team
- 3) Clear Division of Responsibility
- 4) Overall level of commitment perceived
- 5) Transparency / Communication
- 6) Compliance between individual and collective objectives

The level of cooperation can be quantified by combining these 6 factors. The more they are successful the **higher is the cooperation level.**

The table below provides a general description of the six components that constitute the cooperation level.

LEVEL of COOPERATION	
Component	Description
LEADERSHIP	Leadership is a complex of beliefs, communication patterns, and behaviours that <b>influence the functioning of a group and move a group toward the completion of its task.</b> <sup>3</sup> Aspects of leadership include framing, bridging, lobbying and persistency: <ul style="list-style-type: none"> <li>Framing: explaining the objectives of the process.</li> <li>Bridging: fostering collaboration, bringing people together, connecting different interests, and forming a supportive group of stakeholders.</li> <li>Lobbying: creating the right connections to government officials and industry and creating support for the project.</li> <li>Persistency: persevering in his/her endeavour to realise the project plan (including its ambitions &amp; targets), also in adverse conditions, to ensure the continuity of the project.</li> </ul>
BALANCED TEAM	A balanced team is an autonomous group of people with a <b>variety of skills and perspectives that support each other towards a shared goal.</b> It has <b>all the resources and authority</b> it needs to complete projects on its own. It values <b>cross-disciplinary collaboration</b> and iterative delivery.
CLEAR DIVISION OF RESPONSIBILITY	It is important that roles and responsibilities are <b>well defined and clearly assigned to the specific actors and stakeholders involved</b> in the group. Without a clear division of responsibility, the risk of not achieving the targets and goals set at the beginning could become true.

<sup>3</sup> <https://2012books.lardbucket.org/books/a-primer-on-communication-studies/s14-leadership-roles-and-problem-s.html>

<b>OVERALL LEVEL OF COMMITMENT PERCEIVED</b>	<p>There are a lot of factors that go into making a successful working group (including autonomy, cross-discipline collaboration, transparency, iterative delivery/improvement, etc.), but without a healthy dose of <b>trust</b>, all of the other elements fall apart. This can be reflected in the <b>level of commitment</b> of the group and especially in <b>how it is perceived by the individuals</b>.</p>
<b>TRANSPARENCY / COMMUNICATION</b>	<p><b>Transparency means communicating openly</b> and honestly with the other team members and cultivating a culture where <b>information can flow freely between people and team</b>. Although transparency is often glossed over in vague terms, its benefits are tangible, indeed transparency allows every individual of a team to feel like they are a part of something bigger. <b>It's about building trust</b>. It's about helping the team members to create work that is meaningful and makes a tangible difference.</p>
<b>COMPLIANCE BETWEEN INDIVIDUAL AND COLLECTIVE GOALS</b>	<p>Goals are a key component of any endeavour and are a good way to create a destination for where the team wants to end up. In a diverse group made up of many representatives of different organizations and companies working on biomethane and other sectors, <b>having the individual company's objectives in line with the overall goal of the group</b> is a key factor which can <b>encourage greater cooperation</b>.</p>

After the Kick-off workshop, the members of each Biomethane Working Group established in the Target and Supported countries will be asked to answer a short questionnaire in order to define the state of play and their expectations in terms of current relationship and future collaboration. At the end of the 4<sup>th</sup> and final workshop, an ex-post assessment will allow to check if those expectations are met and why this happened and, again, a specific questionnaire will be distributed to this purpose.

Thanks to this assessment, it would be possible to measure the success of the roadmapping process and to investigate on potential barriers that might have hindered these activities. An example of the results of this assessment is reported in the figure below.

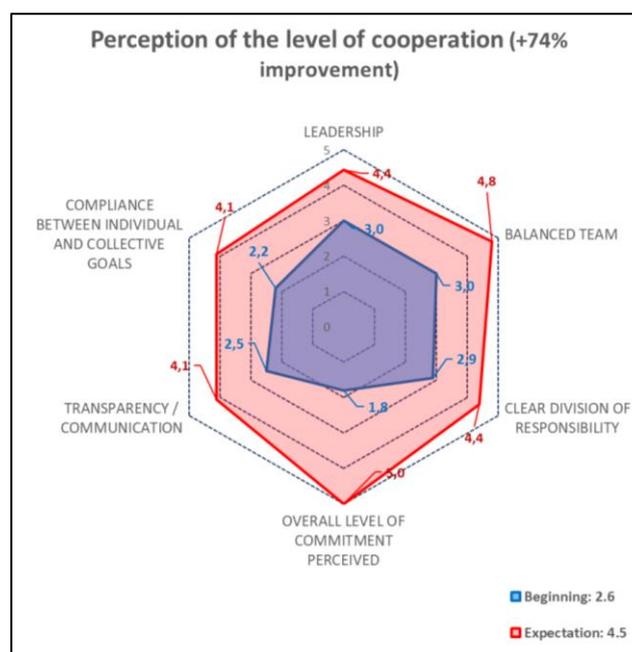


Figure 3: Example of level of cooperation perceived in the Biomethane Working Group- current vs expectation

## 5 Impact Evaluation

Thanks to the planned activities, REGATRACE will substantially contribute to the increase of biomethane deployment in the different project countries.

Indeed, the establishment of a common European biomethane market will indirectly assist biomethane growth. For example, opening the export route will enable new biomethane investments in those countries where the domestic market is not ready to consume its production, due to the lack of government support and other factors. Therefore, beyond facilitating the development of the market, REGATRACE will enable and stimulate the realisation of new individual biomethane projects in the Target countries.

Going down to the investment project level is a very important practice-oriented element in REGATRACE. The challenges faced by investment project developers are handled through developing country tailored guidance for feasibility analysis (D6.4) and guidebook on securing financing for investments (D6.2). Providing detailed information and practical assistance to project developers will shorten time and save costs for their business.

At the end of the REGATRACE project, thereby, we expect a number of new biomethane projects to be realised in every Target country (both completed within the project duration and being developed after REGATRACE).

New biomethane investments are expected also in the Supported countries, where REGATRACE is going to stimulate the creation of a supportive political environment, as well as the increase of cooperation among natural gas and biogas industries while taking steps towards public acceptance. In addition, the opening of the European market for biomethane will certainly encourage biomethane project developers also in those countries where the governments are not supporting the domestic consumption. However, significant impacts of REGATRACE activities in those countries will be less evident and, then, difficult to measure. For these reasons they won't be included in this impact assessment.

The objective of Impact evaluation is to monitor the evolution of biomethane sector in the Target countries for what concerns production, development of new installations and volume of biomethane traded. In the following, facts and figures on biomethane market and trade will be provided for the Target countries, both in terms of current situation and future expectations.

### 5.1 Biomethane production, GHG savings and new investments in the Target Countries

Presently **13** biomethane installations are operated in the target countries of the project (BE, ES, IE, IT, LT, PL and RO) plus EE, producing in total about **550** GWh/yr. According to the estimations provided by the REGATRACE partner countries, about **300** new **biomethane projects** will be conceptualised/developed by 2022 for a corresponding total investment of almost **2,5** billion euros. The amount of biomethane produced will be approximately 6.100 GWh/year in total by the end of the project and it is expected that those countries together will exceed 10.000 GWh/year by 2025. The



amount of CO<sub>2</sub>eq saved is estimated around 2,2 million tonnes within the project duration (cumulative 2019-2022) up to about 6,6 million tonnes by 2025.

The expected impact of the REGATRACE project in those 8 countries would be more than **10 times** increase of biomethane production by the end of the project (2022) and almost **20 times** increase by 2025.

In addition, it is important to recall that REGATRACE aims also at providing efficient, practical, “down to earth” support to the biomethane project developers in every participating country.

In this regard, decision making tools, like the Guidance for the feasibility analysis and the Guidebook on securing financing for biomethane investments, will be produced and it is expected that their adoption would lead to a reduction of time in projects development of about **6-12 months, avoiding the time needed for gathering the necessary professional information** for the deployment of related activities.

Needless to say that it’s not easy to measure and monitor this figure during the duration of the project, however it is an interesting measure of success of REGATRACE and, for this reason, a final qualitative evaluation on how the REGATRACE project would have facilitated the development of new projects will be provided, according to the country experts’ judgments and advice.

### 5.1.1 Current figures and expectations

In the following table, an overview is provided country by country on current figures and expectations for what concerns biomethane plants and corresponding investments for the development of new projects within REGATRACE (by 2022) and beyond (by 2025).

Table 4: Number of biomethane plants and correspondent investment in new projects (2019,2022,2025)

Country	Indicator	Unit	Current figures	Expectation	
			2019	2022	2025
BELGIUM	Number of biomethane plants	-	1	3	6
	Correspondent investment in new projects	M€	-	10	30
IRELAND	Number of biomethane plants	-	1	26	78
	Correspondent investment in new projects	M€	-	160	470
ITALY	Number of biomethane plants	-	8	250	400
	Correspondent investment in new projects	M€	-	2.200	3.200
LITHUANIA	Number of biomethane plants	-	0	1	1
	Correspondent investment in new projects	M€	-	NA	NA
POLAND	Number of biomethane plants	-	0	7	30
	Correspondent investment in new projects	M€	-	44	180
ROMANIA	Number of biomethane plants	-	0	2	4

<sup>4</sup> In Lithuania, the plant is still in the planning phase and an estimation of the amount will be agreed with investors in 2020.

		<i>Correspondent investment in new projects</i>	M€	-	11	21
SPAIN	ES	<i>Number of biomethane plants</i>	-	1	9	14
		<i>Correspondent investment in new projects</i>	M€	-	40	60
ESTONIA	EE	<i>Number of biomethane plants</i>	-	2	6	9
		<i>Correspondent investment in new projects</i>	M€	-	18	31
<b>TOTAL</b>		<b><i>Number of biomethane plants</i></b>	-	<b>13</b>	<b>304</b>	<b>542</b>
		<b><i>Correspondent investment in new projects</i></b>	M€	-	<b>2.483</b>	<b>3.992</b>

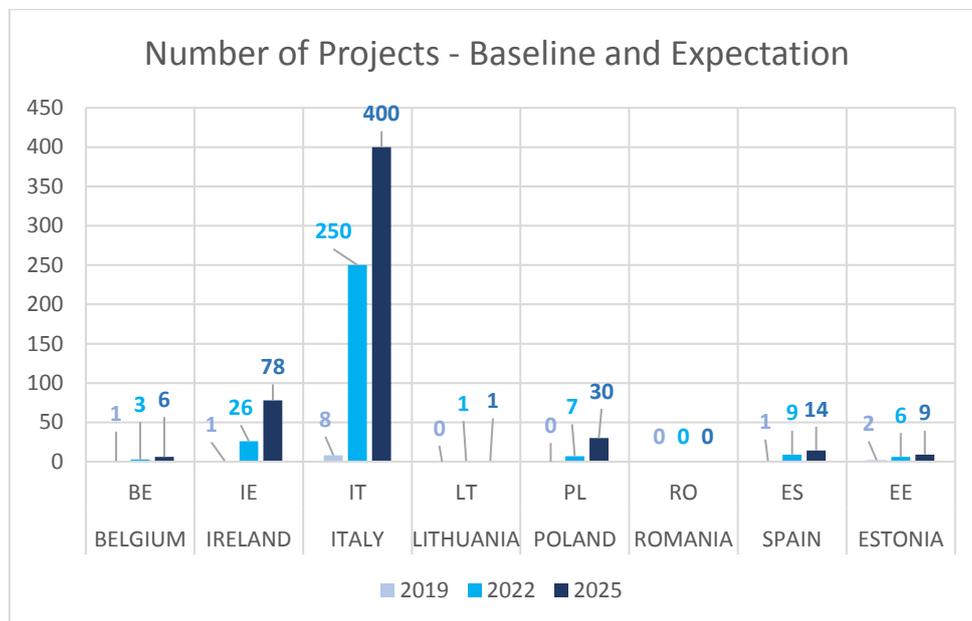


Figure 4: Number of biomethane projects per country

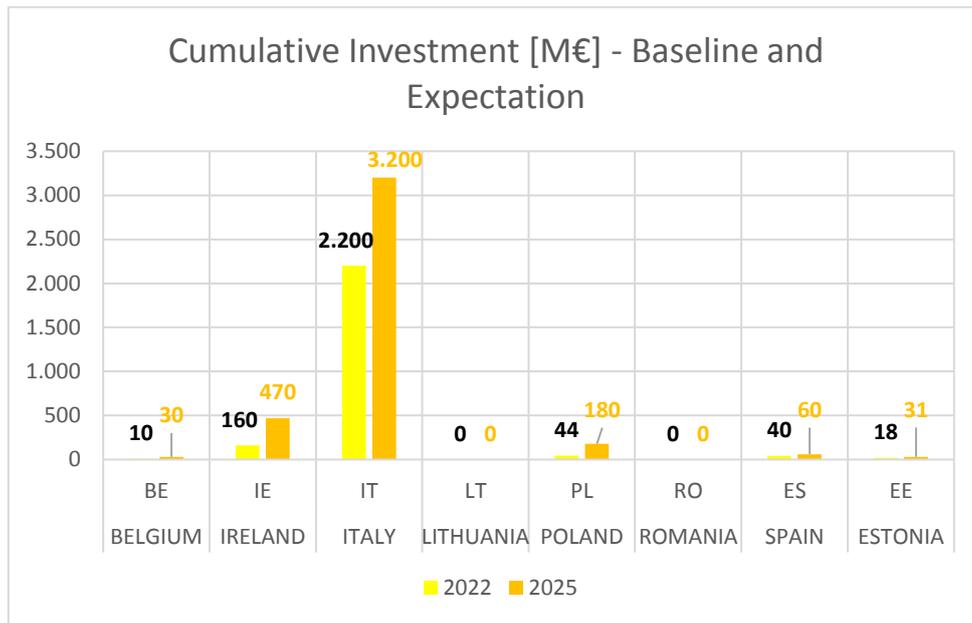


Figure 5: Cumulative investment in new projects per country

Accordingly, an estimation of the volume of biomethane that will be produced by each country is provided in Table 5 along with the corresponding CO<sub>2</sub><sub>eq</sub> savings achievable thanks to the development of new biomethane plants (Table 6).

Table 5: Yearly biomethane production expected by country

Yearly Biomethane Production [GWh/year]				
Country		2019	2022	2025
BELGIUM	BE	5	20	50
IRELAND	IE	40	700	2,000
ITALY	IT	340	4,675	6,800
LITHUANIA	LT	0	12	41
POLAND	PL	0	83	338
ROMANIA	RO	0	52	104
SPAIN	ES	90	350	500
ESTONIA	EE	72	208	312
<b>TOTAL</b>		<b>547</b>	<b>6,099</b>	<b>10,144</b>

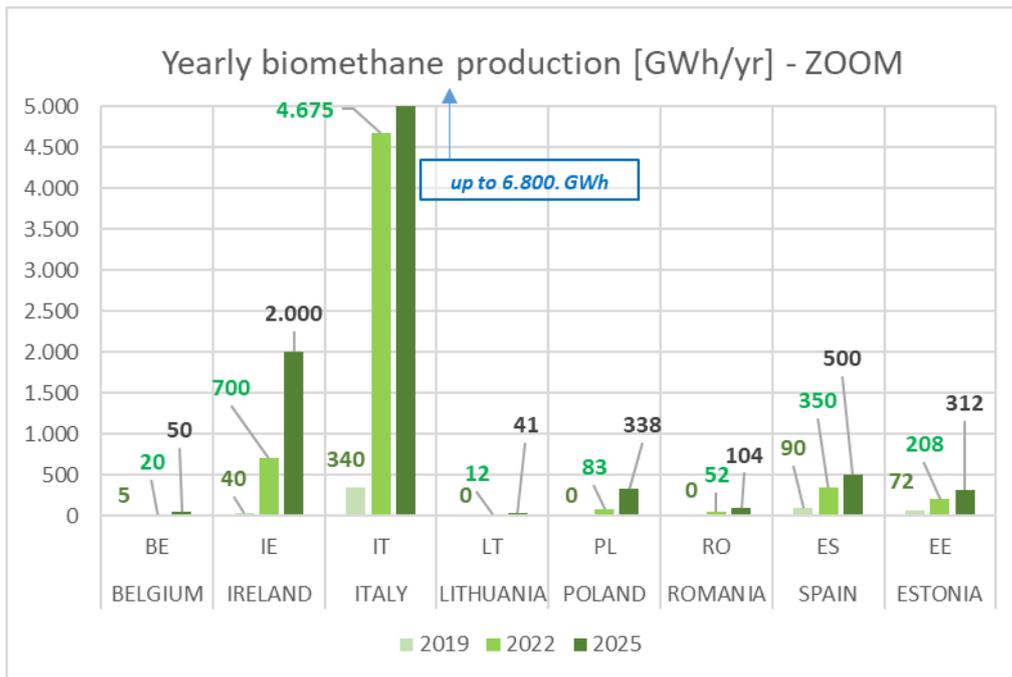


Figure 6: Expected biomethane production per country

Table 6: GHG emissions saved per country within and beyond REGATRACE

		Cumulative CO <sub>2</sub> eq saved [tCO <sub>2</sub> eq]	
Country		Within REGATRACE (2019-2022)	Beyond REGATRACE (2019-2025)
BELGIUM	BE	8.424	28.642
IRELAND	IE	249.350	1.041.206
ITALY	IT	1.689.854	4.768.826
LITHUANIA	LT	4.044	19.881
POLAND	PL	27.799	155.423
ROMANIA	RO	17.495	61.232
SPAIN	ES	148.262	375.710
ESTONIA	EE	94.349	234.524
<b>TOTAL</b>		<b>2.239.578</b>	<b>6.685.445</b>

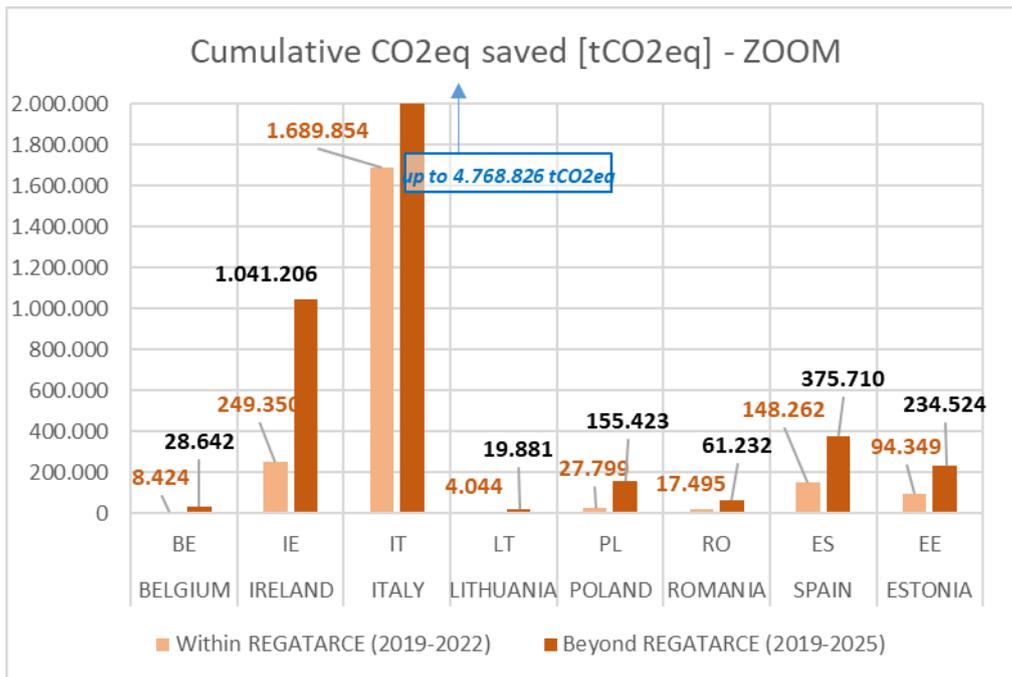


Figure 7: GHG emissions savings per country within (2019-2022) and beyond (2019-2025) REGATRACE

The trends shown above are closely linked to the different policies that these countries are developing to support biomethane. In the next chapter (Chapter 6) an overview of the policy framework on biomethane established, or to be established, in the different REGATRACE countries will be provided in order to outline valid and reliable background where the current figures and the future estimations above reported can be reasonably contextualized.

At the end of the project, a final assessment will be done in order to verify whether these expectations are met.

## 5.2 Cross-Border Biomethane Trade

Through the establishment of the **biomethane trading platform**, REGATRACE will significantly increase the level of cross-border transfer of European Biomethane Guarantees of Origin (EGBO) in Europe.

Presently this trade is marginal, as its yearly volume does not exceed **200 GWh** yearly (Table 7).

The envisaged cooperation of **16 GoO** issuing bodies in 16 countries, i.e., those with registries (AT, CH, DE, DK, EE, FI, FR, NL and UK) and target ones (BE, ES, IE, IT, LT, PL and RO) in the frame of their European network, will result in GoO trading turnover of **500 GWh** by **2025** and **2.500 GWh** by **2030**.

The total amount of cross-border biomethane traded will be monitored and, at the end of the project, final figures will be reported and compared with those initial expectations (2022 and projections to 2025 and 2030).

*Table 7: Volume of biomethane traded across countries*

Countries	Volume of cross -border trade in 2018 <sup>5</sup>
	Amount [GWh]
Denmark to Switzerland	116
UK to Switzerland	32
UK to Germany	35
Austria to Germany <sup>6</sup>	4,6 <sup>7</sup>
<b>TOTAL</b>	<b>188 GWh</b>

<sup>5</sup> DENA, "[Branchenbarometer Biomethan](#)", 2019

<sup>6</sup> Data provided by AGCS

<sup>7</sup> In 2019 this value amounts to 18GWh (Source AGCS)

## 6 Policy Evaluation and Replication Assessment

The nature of grants, subsidies, planning laws, etc. at any level from EU down to national and regional level can have profound impacts on the development of the biomethane market. Therefore, understanding the context is crucial to identify the main barriers and success factors influencing biomethane sector in a given country.

REGATRACE Policy Evaluation focuses on the policy and economic framework standing behind the biomethane sector of the project countries.

The aim of this activity is to assess the current policy context on biomethane in the project countries, including existing financial support schemes for biomethane development, and to monitor their evolution during the duration of the project.

To this end, Policy Evaluation is structured as follows:

- 1) Assessment of barriers and targets for the development of biomethane in REGATRACE Target countries (Paragraph 6.1 -*REGATRACE countries overview*);
- 2) Identification of the most successful national policies on biomethane according to properly selected policy evaluation criteria (Paragraph 6.2- *Policy Evaluation Criteria*);
- 3) Estimation of the Replication Potential of a number of selected national policies<sup>8</sup> in the REGATRACE Target countries (Paragraph 6.3 - *A new methodology for estimating the Replication Potential*)

Within this report, a general overview of the policy framework is provided country by country, along with the list of the most relevant laws/regulations/acts currently in force (See D6.1 “Mapping on the state of play of renewable gases market in Europe” for the detailed baseline). Moreover, a comprehensive explanation of the methodology that will be used for the policy and replication assessment is provided.

At the end of the project, the policy framework will be updated, the methodology applied, and results assessed in D7.3, that will include also potential new policies developed during the duration of the project.



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<sup>8</sup> implemented in more advanced countries, i.e., having registries.

### 6.1 REGATRACE countries overview

In this paragraph, an overview of barriers and targets related to the biomethane sector is provided along with a concise yet comprehensive description of the most relevant biomethane-related policies currently in place in all the **Target Countries**.

The same baseline information is given also for some more advanced countries, i.e. those where established biomethane registries and/or national issuing bodies for biomethane GoO are in operation, in this case: **Austria, Estonia and Germany**. Including “advanced” countries in this assessment is fundamental for the Replication Assessment that will be carried out thereafter (Paragraph 6.3).

#### 6.1.1 REGATRACE countries with registry

##### ▪ AUSTRIA

The former Austrian government published the **#mission2030** as their climate and energy strategy which outlines visions for Austria to become climate neutral:

- By 2030, Austria should have 100% renewable electricity (nationally, on balancing level).
- By 2030, 45-50% of renewable energy in the gross energy consumption balance.
- The development of a **greening-the-gas strategy** is deemed necessary: fossil methane shall be partly replaced by **renewable methane, hydrogen and synthetic methane from renewable electricity, a GoO system shall be elaborated;**
- Focus on energy efficiency: primary energy should be reduced by 25-30%;
- Sector coupling to make use of energy storages beyond electricity storages
- Transport sector will be based on the principles ‘avoid, switch, improve’ and will focus on e-mobility.
- So-called lighthouse projects are described: lighthouse 7 is concerned with renewable hydrogen and biomethane

**National  
Policy  
targets**

##### **NECP – National Energy and Climate Plan**

Moreover, the Austrian NECP, National Energy and Climate Plan, sets out national strategies in five dimensions: decarbonisation, energy efficiency, security of energy supply, internal energy market, Research & innovation & competitiveness.

Barriers on further developments in the biomethane sector are identified in:

- **Lack of Regulation**  
Currently, there are no direct national incentives for biomethane. There are Feed-in tariffs for renewable electricity from biogas, according to the Austrian Renewable Electricity Act (ÖSG, Ökostromgesetz).
- **Lack of national targets**  
The Austrian NECP lacks clear targets, strategies and actions. The first version which was submitted to the EC lacks several chapters, especially the calculations of CO2 emission mitigation and the respective financial plans.
- **Not one common clearing agency for Renewables**

**Problems &  
Barriers**

Austria depicts the example of having different registries interacting on the national market to cover different purposes of biomethane end uses. Apart from the Biomethane Registry Austria covering the confirmation for Feed in Tariffs for renewable electricity from biomethane, the Environmental Agency (UBA, Umweltbundesamt) operates the national registry for sustainable biofuels. The regulator (E-Control) has been appointed as issuing body for gas Guarantees of Origin for the purpose of labelling according to RED II.

Each registry operates based on a separated IT-system, which requires interconnection via sophisticated processual and technical solutions as any possibilities for double counting must be prevented. AGCS is dedicated to elaborating collaboration agreements with all existing registries in order to prevent any multiple counting of renewable gas volumes and to allow for a transparent and secure exchange of data and information concerning renewable gases in Austria.

- **Misleading policy targets**

There are no direct subsidies for renewable gas – at least not until a new government will be formed and will roll out a new law. The market development is stagnating because of insecurity due to lack of government and regulations. There are over-proportional subsidies and strategies for e-Mobility.

**Interlink of Registries in Austria**

Thanks to REGATRACE, the AGCS Biomethane Registry has a boost in resources and available data and can thus act more focused on the building of linkages and interfaces between existing national registries established for different purposes. It is a common goal to harmonise processual and technical systems between those registries.

**Market integration**

Within the REGATRACE Project, WPs and tasks are focused on establishing the necessary procedures and structures to build a dashboard and a trading hub which will support biomethane market integration in Austria as well in Europe-wide.

**Knowledge base**

REGATRACE provides a relevant network and significant knowledge transfer between countries.

**Sector coupling**

Thanks to the resources of REGATRACE WP4, non-technical and administrative barriers for sector coupling in Austria will be overcome.

**REGATRACE  
policy  
targets**

In the following table, the list of measures currently in force in Austria is reported.

Name of Regulation/Act/Measure...	Type <sup>(1)</sup>	Description
<b>Austrian Renewable Electricity Act</b> (ÖSG, Ökostromgesetz)	Feed-in Tariff	<b>Renewable Electricity Act (Ökostromgesetz, ÖSG)</b> <ul style="list-style-type: none"> <li>- No terminology for “biomethane”; power generation from biomethane in category „biogas plants“</li> <li>- 2008 amendment: subsidies for power from biomethane withdrawn from gas grid were implemented</li> <li>- 2017 amendment: prolongation of then current FiT for three further years for plants fulfilling specific criteria (sustainability, efficiency, business concept)</li> <li>- 2019 amendment: prolongation of FiT until new law (EAG) is implemented</li> <li>- Biomethane Certificates created by AGCS Biomethane Registry Austria are basic proof for the produced and injected biomethane volumes and their production/sustainability criteria → to receive FiT for the electrified biomethane</li> </ul>
<b>Gas Economy Act &amp; Regulation on Gas Labelling</b>	Regulation on gas labelling	<b>Gas Economy Act (Gaswirtschaftsgesetz, GWG, 2011)</b> <ul style="list-style-type: none"> <li>- § 130 Gas Labelling for end consumer:</li> <li>- Requests energy suppliers to provide labelling on the annual bill for their end consumers concerning the origin of gases providing percentages of gas composition concerning the types biogas, landfill gas, sewer gas and fossil gas; based on the total via the gas grid delivered gas (kWh) to the end consumer</li> <li>- Labelling is only obligatory when a threshold of a total of 30 million cubic meters of renewable gases (types as above) are injected into the Austrian gas grid within the previous calendar year.</li> </ul> <b>Regulation on Gas Labelling (Gaskennzeichnungsverordnung, Gken-V, 2019)</b> <ul style="list-style-type: none"> <li>- Partial implementation of RED II → currently on voluntary basis; obligatory with implementation of RED II or reaching limits of GWG § 130</li> <li>- Monitoring authority: Regulator (E-Control)</li> <li>- Requests labelling the origin of gases providing percentages of composition of energy carriers: fossil gas, renewable gas and other gases</li> </ul>
<b>Regulation on transportation fuels</b>	Quota on biofuels	<b>Regulation on transportation fuels (Kraftstoffverordnung, KVO, 2012)</b> <ul style="list-style-type: none"> <li>- 6,3% diesel fuel, 3,4% gasoline fuels must be replaced + GHG emission mitigation of 6%</li> <li>- Settlement and monitoring: Austrian Environmental Agency (Umweltbundesamt, UBA); Database eINa</li> </ul>

		<ul style="list-style-type: none"> <li>- Requirements for biofuels are:               <ul style="list-style-type: none"> <li>o Sustainability</li> <li>o Mass balance</li> </ul> </li> <li>- Volumes of biomethane in transportation sector are currently close to zero in Austria;</li> <li>- Biomethane Certificates will be used as basic proof for the produced and injected biomethane volumes and their production/sustainability criteria when the respective biomethane is used for the purpose of transportation fuel</li> </ul>
<b>Tax reform act 2020</b>	Tax exemption	<b>Tax reform act 2020 (Steuerreformgesetz 2020)</b> <ul style="list-style-type: none"> <li>- Tax on fossil gas was updated with a tax reimbursement valid for sustainably produced renewable gases</li> <li>- Valid as of 1<sup>st</sup> of January 2020 but processual settlement not yet defined.</li> <li>- Biomethane Certificates will be used as basic proof for the produced and injected biomethane volumes and their production/sustainability criteria → to receive reimbursement of the previously paid tax on gases</li> </ul>

### ▪ ESTONIA

The Renewable Energy Directive (RED) requires all EU Member States to ensure that 10% of the energy use in transport comes from renewable sources by 2020. Estonian Ministry of Economic Affairs and Communications defined an **action plan for biomethane development**, which aims to **cover at least 2% (20 million m3 per year) of fuels used in transport sector with biomethane by 2020**. In order to achieve that, Estonia has a support measure for biomethane producers until 2023 (**Biomethane Market Development Support Act**).

Moreover, the **Estonian National Energy and Climate Plan (NECP 2030)** set the target to produce up to 40 Mm3 of biomethane (375 GWh) by 2030.

Estonia already has a biomethane registry, but barriers for the development of the sector are still the small number of CNG stations and the limited choice of natural gas vehicles. In addition, new potential biomethane producers are not very eager to invest in biomethane production, because the subsidy scheme ends in December 2023 and they are not sure what will happen afterwards. Currently there are uncertainty for what happens in 2024 onwards, **but the REGATRACE project will definitely create new opportunities for Estonian producers.**

**Thanks to REGATRACE, Estonia will be able to import biomethane** and in this way national targets can be more easily achieved. Moreover, potential biomethane producers are more convinced to invest in biomethane because soon they will be able to export biomethane to other European countries.

**National Policy targets**

**Problems & Barriers**

**REGATRACE policy targets**

In the following table, the list of measures currently in force in Estonia is reported.

Name	Type	Description
<b>Biomethane Market Development Support Act</b> <i>("Biometaanituru arendamise toetamise toetuse kasutamise tingimused ja kord")</i>	Quota/green certificates scheme	<p>According to this support measure, biomethane producers (01/01/2018- 31/12/2023) can get a fixed subsidy after their production has been consumed. If biomethane is consumed in the <b>transport sector: the subsidy amount is 100€/MWh</b> – monthly natural gas market price (GET Baltic).</p> <p>If biomethane is consumed in <b>other sectors</b> (only on-grid consumers!): <b>the subsidy amount is 93€/MWh</b> – monthly average natural gas market price (GET Baltic). Thanks to the subsidy scheme, Estonia has currently 2 producers and hopefully more of them will be starting biomethane production in the coming years. Since the price of biomethane is almost 3 times higher than the price of natural gas, nobody would buy biomethane as a transport fuel without this support scheme. <b>This subsidy lowers the price of biomethane at the fuel station for the end customer and makes it much more attractive due to its green value and reasonable price.</b></p>
<b>Subsidy for building CNG station</b> <i>("Biometaani tootmise ja transpordisektoris tarbimise toetamine")</i>	Investment Support	<p>This subsidy supports the implementation of new biomethane stations that offer the possibility to fill-up from a public individual or network station. <b>The maximum subsidy is 35% of a total project cost with a maximum cap of 350.000 € per project.</b></p> <p>Before this subsidy, there were 3-5 CNG stations in Estonia. Today there are 17 CNG stations and 11 more will be built by the end of 2020.</p>
<b>Subsidy for public fleets</b> <i>("Biometaani tootmise ja transpordisektoris tarbimise toetamine")</i>	Investment Support	<p>This subsidy scheme aims to support the introduction of public buses running on biomethane in the public transport service. The subsidy is paid to the public fleets during the first year for running on biomethane. <b>The maximum subsidy is 30% of a total project cost with a minimum cap of 350.000 € per project and a maximum cap of 4.000.000 € per project.</b> Currently, the public transport fleets in two cities in Estonia are receiving the subsidy.</p>
<b>Alcohol, Tobacco, Fuel and Electricity Excise Duty Act</b>	Tax exemption	<p>According to the <b>Alcohol, Tobacco, Fuel and Electricity Excise Duty Act</b>, biomethane which is verified with the Guarantees of Origin is exempted from excise tax in Estonia.</p>

### ▪ GERMANY

In Germany, very ambitious goals have been established at national level for what concerns the penetration of renewable energies in different sectors. Biomethane could play a key role in the achievement of most of them, as shortly reported below:

- Share of **renewable power** of 65% in 2030
  - The contribution from biomass shall be reduced in absolute numbers from 50 TWh in 2018 to 42 TWh in 2030

**National Policy targets**

- Reduction of greenhouse gas emissions in **transport** by 40 to 42% by 2030 in comparison to 1990
  - share of 0,5 % advanced biofuels in the transport sector in 2025
  - amendment of transport goals from RED2 is in preparation
- Reduction of greenhouse gas emissions in **agriculture** by 6% from 2016 to 2030
  - A minimum share of 30% of manure shall be utilized in biogas plants till 2030
- Reduction of greenhouse gas emissions in the **heating sector** by 40% till 2030

For what concerns biomethane sector, several barriers are hampering its development:

- The maximum bid price for renewable power from biomass is about 40% lower than the feed-in premium that was paid for biomethane in 2014. As a result, there is only very little interest from biomethane projects to participate in the tender for biomass.
- From 2020 onwards, the feed-in premium for biomethane CHP plants phases out.
- Renewable heat from biomethane can only count towards the renewable heating obligation of new buildings if produced in a CHP plant. The obligation to use biomethane in CHP only reduces the economic viability of biomethane in comparison to other options.
- There is no political vision strategy for the use of biogas in the short run.

**Problems & Barriers**

For what concerns registries in Germany, there are some overlaps. Indeed, there are 2 national registries in operation and responsibilities are overlapping between the federal ministries in the national implementation of the recast of the Renewable Energy Directive (RED2).

The development of guidelines for the cross-sectoral verification and documentation of power to gas concepts would **support the national implementation and adaptation of verification standards.**

**REGATRACE policy targets**

In the following table, the list of measures currently in force in Germany is reported.

Name	Type	Description
<b>Renewable Energy Sources Act (EEG)</b>	Feed-in Premium	<b>CHP plants which run on biomethane</b> can submit a bid towards to <b>two biomass tenders per year</b> . The bids with the <b>lowest prices are eligible to receive a feed-in premium</b> according to their bid for a period of <b>20 years</b> (10 years for biomass plants that already receive a feed-in tariff according to the EEG).
<b>Greenhouse gas quota (37. BImSchV)</b>	Quota obligation	<b>Petroleum companies must improve their GHG-balance</b> by adding low carbon and renewable fuels to diesel and gasoline fuels. The <b>quota obligation is a 4% - decrease of GHG emissions in 2019 and 6% in 2020.</b>

		<p>Biomethane and liquefied biogas can count towards that quota obligation.</p> <p>In comparison to other biofuels, biomethane from wastes and residues has a relatively low GHG emission value. The higher the quota price in terms of CO<sub>2</sub>-emissions, the higher the value of low emission biofuels such as biomethane.</p>
<p><b>Renewable Heat Act</b> (<i>EEWärmeG</i>)</p>	<p>Quota obligation</p>	<p>In <b>newly built</b> houses, at least <b>30% of the heat demand must be covered by renewable sources</b>. Biomethane can be applied as renewable source, if used in a CHP plant.</p>
<p><b>Gas Grid Ordinance</b> (<i>GasNZV</i>)</p>	<p>Privilege</p>	<p>Biomethane <b>upgrading</b> plants have a <b>privileged access to the gas grid</b>. The <b>costs of connecting</b> biomethane upgrading plants with the gas grid are <b>shared between the plant operator (25%) and the DSO (75%)</b>. The burden of the biomethane plant operator is capped at 250.000 Euros.</p>

### 6.1.2 REGATRACE Target countries

#### ▪ BELGIUM

For what concerns legislation on renewables, the three Belgian regions (Flanders, Wallonia and Brussels Region) are considered as separate entities.

In the following, a policy overview is provided for Flanders and Wallonia separately. The legislation in Brussel is not developed because there is no biogas/biomethane production. However, in Brussels Region there is possibility for a CHP to run on biomethane and receive more support, but it is not clear how this should be proven. Thus, it is not expected biogas/biomethane production in Brussel Region in the coming decade.

#### Flanders

In the region of Flanders, there are no explicit regional targets set out. Nevertheless, there is only a limited investment support for Biomethane upgrading (as outlined in the table below).

The Flemish Energy Agency (VEA), who plays an important influencing role on policy makers, is not in favour of biomethane upgrading.

Today, the renewable **focus** of Flanders is on the **production of green electricity**. In this respect VEA is promoting the **direct use of biogas in CHP**, while saying that Biomethane upgrading creates a higher CO<sub>2</sub> equivalent emission due to a substantial higher CH<sub>4</sub>-slip. The support for green electricity lasts 10-15 years and most of the plants are coming to the end of the support period. **For biomethane upgrading there is a limited investment support possible via a tender process**, but this support is **not sufficient for a positive business-case**.

In absence of another kind of support for Biomethane upgrading, the 2 TWh biogas produced today risks fading out. Only **completely new build plant** (digester+ biogas

**National Policy targets**

**Problems & Barriers**

CHP) can receive new green electricity support for 15 years, but not many producers are willing to demolish their existing digesters and rebuild from scratch. Most of them still have digesters that can continue to operate for another 10 – 15 years and want to switch to biomethane upgrading. As the biomethane sector is highly dependent on feedstock prices and on the cost or limited revenues of the digestate, biomethane upgrading can be profitable only with a Feed-in Premium (or FIT) support or via indirect support given to a satellite CHP on the gas grid receiving additional support for using biomethane as a primary fuel.

Other barriers lay in the regulation on digestates (especially manure) which put a high financial burden on the sector while creating obstacles for commercialization of the products (e.g. bio-fertilizers). In general, Flanders does not recognize the additional benefits of biogas/biomethane upgrading enough to be convinced to support the sector sufficiently to maintain its current production or even increase the production, knowing that the current ‘easy to get’ potential in Flanders is around 10 TWh, which would already answer to around 70% of the CO2 emission quota of the region.

For Flanders the REGATRACE project can contribute in several ways:

1. The development of guarantees of origin has started based on new Flemish decree of August 2019, and the relevant REGATRACE work packages will contribute to the development of the necessary methodologies, systems and to standardization the guarantees of origin. One of the more difficult challenges is how to make the GO exchangeable between the Belgian regions and in a next step with the adjacent member states.
2. Another important contribution expected from the REGATRACE project - mainly coming from the industry and biogas sector - is to have a uniform European approach on the valorisation of the CO<sub>2</sub>eq emission of the Green gas.<sup>9</sup>
  - a. Producers are very interested in a CO<sub>2</sub>eq emission value for their green gas, but the calculation method should be standardized for Europe and taking into account all avoided emissions. This methodology should also create level playing field with renewables technologies for electricity.
  - b. The industry is looking for means to valorise the CO<sub>2</sub> part of green gas for instance via the ETS system. Non-ETS reporting should also create benefits for the industry when using green gas.
3. Finally, there is a maximum potential of 20 TWh for injectable biomethane in Belgium of which 70% in Flanders. Yielding this potential could, in an important way, contribute to the CO<sub>2</sub>eq climate objective of Flanders. The Flemish region therefore should look at how it can support the sector or how it can create the externalities that will develop the sector. The REGATRACE project will assist the region of Flanders/Belgium in the development of a regional/national roadmap that would support policy makers in the decision-making process for biomethane market development.

**REGATRACE  
policy  
targets**

<sup>9</sup> Valorisation means that CO<sub>2</sub> emission reduction by biomethane (avoided fossil energy + agricultural avoided emission) should be recognized for companies for ETS / non ETS / or CO<sub>2</sub> taxes. Also Member states could profit from this approach related to their climate objectives.

In the following table, the only measure currently in force in Flanders is reported.

Name	Type	Description
<i>Vlaams Energiedecreet van 8 mei 2009, artikels 8.3.1 en 8.4.1</i>	Investment support	Every year (in some case twice per year) a <b>tender process</b> is launched by VEA for <b>biomethane upgrading</b> . A producer can receive <b>up to max. 1 M€ of investment support</b> , limited to between 45% (for large companies) to 65% (for small companies) of the CAPEX for a biomethane upgrading

### Wallonia

In Wallonia, like in Flanders, there are no explicit targets but there is an indirect support mechanism for CHP using biomethane.

In Wallonia the initial **support** system (AGW 2001) was focused on **biogas to be used in local CHPs** that received **additional green certificates**. These certificates also rewarded the level of CO<sub>2eq</sub> emission reduction of the biogas plants. This support scheme for local CHPs has a duration of 15 years but for most of the plants is **coming to an end**.

Moreover, in order **to receive new support** for a local biogas CHP, **a new plant has to be built from scratch**. To avoid the phase-out of the existing biogas plants – with the adaptation of the related decree in March 2018 - the **Wallonian government has extended the support** with green certificates to satellite CHPs connected to the natural gas grid. Those CHPs using biomethane produced in Wallonia as a primary fuel **can receive in average 2.5 times more certificates than for burning natural gas**. The height of the support – besides an economical component – also depends on the CO<sub>2eq</sub> content of the biomethane. With this **additional income** the **CHP company can pay the biomethane producer** for the needed premium for its biomethane. This result for the biomethane producer in a **total revenue of around 75€/MWh** (all revenues included) which is **just enough to cover costs for producing biomethane**. For the **smaller agro-producers** Wallonia has also set-up a **minimum price guarantee of 40-50€/MWh, but this measure is not yet in force**, as the European commission still evaluating if this support should be considered as state-aid, in which case it would not be legally compliant. The minimum price guarantee **cannot be cumulated with the CHP support mechanism**.

**If the satellite CHP purchases biomethane outside Wallonia, it cannot receive the additional support and is considered as a CHP using natural gas.**

For Wallonia the REGATRACE project can contribute in several ways:

1. The development of guarantees of origin via the system of “label de garanti d’origine (LGO)” is only usable for CHPs in Wallonia as support is only received when using these LGO. The Wallonian system has its merits but the relevant Regatrace work packages can contribute to the evolution towards European recognized methodologies and standardization of the guarantees of origin. One of the more difficult challenges is how to make the GO exchangeable between the Belgian regions and in a next step with the adjacent member states

**National Policy targets**

**Problems & Barriers**

**REGATRACE policy targets**

2. Another important contribution expected from the REGATRACE project – mainly coming from the industry and biogas sector - is to have a uniform European approach on the valorisation of the CO<sub>2</sub>eq emission of the Green gas.
  - a. Wallonia has already developed its own CO<sub>2</sub>eq calculation method but it is only applicable in Wallonia, and it is linked to the support a CHP consumer will get. A unique standardized European CO<sub>2</sub>eq methodology could be a benefit as long as it does not impact the support. This methodology should also create level playing field with renewables technologies for electricity.
  - b. The industry is looking for means to valorise the CO<sub>2</sub> part of green gas via the ETS system. Non-ETS reporting should also create benefits for the industry when using green gas.
3. Finally, 30% of the maximum potential of 20 TWh for injectable biomethane in Belgium can be produced in Wallonia. Yielding this potential could, in an important way, contribute to the CO<sub>2</sub>eq climate objective of Wallonia. The region is already supporting the sector but should explore how it can create the externalities that can further develop the sector. The REGATRACE project will assist the region of Wallonia/Belgium in the development of a regional/national roadmap that would support policy makers in the decision-making process for biomethane market development.

In the following table, the only measure currently in force in Wallonia is reported.

Name	Type	Description
<p><i>“29 MARS 2018. — Arrêté du Gouvernement wallon modifiant l’arrêté du Gouvernement wallon du 30 mars 2006 relatif aux obligations de service public dans le marché du gaz, l’arrêté du Gouvernement wallon du 30 novembre 2006 relatif à la promotion de l’électricité produite au moyen de sources d’énergie renouvelables ou de cogénération et l’arrêté du Gouvernement wallon du 23 décembre 2010 relatif aux certificats et labels de garantie d’origine pour les gaz issus de renouvelables”</i></p>	<p>Indirect support to CHP using biomethane from the Grid</p>	<p>The support for biomethane is created indirectly via an <b>increased support mechanism for satellite CHP’s on the natural gas grid using biomethane</b>. This has <b>to be proven via a guarantee of origin</b> (called “label de garantie d’origine or LGO”). The producer is payed through a B2B contract with the CHP company (in relation to the additional support the CHP company receives) for the premium it needs to cover the costs of production of its biomethane. A minimum price guarantee for ‘smaller’ producer is still under evaluation with the European commission for approval.</p>

### ■ IRELAND

In Ireland, important steps concerning the development of biomethane sector are very close to being achieved, in particular:

- Inclusion of agriculture and waste sourced biomethane in the National Energy and Climate Plan 2021-2030 due to be submitted by Irish Government to EU Commission by 20<sup>th</sup> December 2019.
- Amendment of Climate Action Plan (national policy document) in the current review for 2020, with biomethane from agriculture & waste sources having accurate data and Marginal Abatement Cost Curve (MACC) that reflects the factual costs of carbon abatement of agricultural sourced biomethane.

The current barriers or constraints identified by Irish Government to the Renewable Gas Forum Ireland (RGFI) in supporting an indigenous biomethane industry are as follows:

- **EUROSTAT** – (SHARES) being able to account for the GHG/carbon intensity savings in the national GHG inventory.
- **Cost of technology** – Irish Government is using the MACC<sup>10</sup> to establish cost of GHG emissions abatement. The Climate Action Plan quoted that agriculture sourced biomethane had a MACC of €377/t CO<sub>2</sub>, which is referencing the use of micro algae to produce biomethane. RGFI is reporting a MACC range of between €78 to €150/t CO<sub>2</sub> for biomethane from various scenarios.
- **Who pays?** – the Irish Government is seeking to establish who will pay for the support scheme required for biomethane. RGFI has proposed to socialise across all gas consumers through a Public Service Obligation (Gas PSO) to ring fence this funding to support biomethane at the point of production. It was proposed that the Gas PSO is in place until Ireland reaches a level of maturity in biomethane production, say 4 TWh. Once the level of maturity is achieved, it would be appropriate to implement a Shipper/Suppliers Obligation Scheme.
- **Sustainability** - Irish Government wants to ensure that the biomethane produced from ryegrass and slurry can is compliant with RED II sustainability and GHG reduction criteria. This substrate mix has not been used in many cases and there is an absence of real evidence to demonstrate its suitability. There are a number of scientific papers which calculate an exemplar LCA. However, there are a number of variables inputting to the LCA which can produce a range of GHG value end results. RGFI is advising Producers to obtain certification from the existing EU Voluntary Schemes (ISCC/RedCert/BetterBiomass) to overcome this issue and obtain accreditation from EU Commission. This will validate the sustainable production of biomethane, the only renewable energy in Ireland to do so. RGFI recognises the vast potential to decarbonise the difficult sectors of agriculture, transport and heat.

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<sup>10</sup> Marginal Abatement Cost Curve

REGATRACE will provide support in:

- highlighting that Ireland is one EU Member state that does not have a policy of supporting biomethane.
- adding to competitiveness and sustainability, addressing the difficult sectors to decarbonise.
- providing a clear pathway for access to renewable gas, in the immediate term promoting Biomethane, medium term perhaps utilising some capacity for hydrogen and longer term, Carbon Capture and Storage.
- the standardisation and simplification of recognising the GoO's across MS and establishing minimum sustainability criteria for biomethane production.
- Recognising the advantages of achieving the highest carbon intensity savings possible. Inclusion of green CO2 would be an advantage.
- Definition of green hydrogen, biological sources.
- Distinguish and define acceptable green gases from renewable sources.

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As said, there are no supporting measures on biomethane currently in force in Ireland. In the following table, some details are reported on the Climate Action Plan 2020-2030 that is currently under review and will include interesting implications for biomethane.

Name	Type	Description
<b>Climate Action Plan – 2020-2030 National Energy &amp; Climate Plan 2021-2030 Gas Public Service Obligation</b>	Support Scheme Renewable Heat (SSRH) and/or Gas PSO	<p>The Irish Government is seeking to establish <b>who will pay for the support scheme required for biomethane</b>. RGFI has proposed to <b>socialise across all gas consumers through a Public Service Obligation (Gas PSO) to ring fence this funding to support biomethane at the point of production</b>. We proposed that the Gas PSO is in place until Ireland reaches a level of maturity in biomethane production, say 4 TWh. Once the level of maturity is achieved, it would be appropriate to implement a Shipper/Suppliers Obligation Scheme.</p> <p>RGFI believes that the Gas PSO would be instrumental in supporting and delivering 4 TWh of biomethane in Ireland by 2027/2028.</p> <p>The Gas PSO would fund the Contract for Difference on a fixed price at the point of production allowing for the variations to whole price of gas and value of the GoO's over time. The biomethane support scheme would be for a 15 year term.</p>

### ▪ ITALY

In Italy<sup>11</sup>, the growth of RES has been supported by different mechanisms and significant revisions occurred over time, in particular in the bioenergy sector. In order to comply with the **10% EU RES target in the transport sector**, Italy introduced, through the regulations implementing Directive 2009/28, a **quota obligation of biofuels for suppliers of petrol and diesel from fossil sources**. The obligation can be met by acquiring, in whole or in part, the equivalent quota or corresponding rights from others, buying the so-called Biofuel Certificates (CICs). It is relevant to say that a **mandatory quota for “advanced biofuels” has been**

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<sup>11</sup> IEA, "[IEA Bioenergy – Country Reports. Italy – 2018 Update.](#)", September 2018

**introduced.** Advanced biofuels are produced from materials listed in Annex 3 of the Decree and include agricultural and industrial wastes (apart from UCOs and animal fats), residues, ligno-cellulosic materials, cellulosic materials and algae. The measure specifies that the **mandatory quota for advanced biofuels must be fulfilled for 75% by biomethane and for 25% by other advanced biofuels.** The respective shares will be reviewed every two years.

IN March 2018, a new Decree on biomethane was issued (see table below).

The Italian strategy for the development of the biomethane sector was based on the conversion of biogas plants to biomethane plants. At present, the technical specifications for upgrading biogas to biomethane are not complete yet, hampering the biomethane production take-off in Italy.

Once this will be solved, efforts will be focused on the establishment of the Italian biomethane registry.

Thanks to the REGATRACE project, it will be possible to do the groundwork for the establishment of the Italian national registry. Within REGATRACE, it will be investigated the possibility to establish a voluntary registry that could cooperate in future with the official registry after the project lifetime.

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Details on the Italian Decree on biomethane are reported in the table below.

Name	Type	Description
<b>Italian Biomethane Decree</b>	Feed-in premium (FiP)	<p>The Italian Government issued the Decree of the Ministry of Economic Development of March 2<sup>nd</sup> 2018<sup>12</sup>, introducing a support scheme for biomethane injected into the natural gas grid and for advanced biofuels to be used in the transport sector. The measure specifies that the <b>sub-target for advanced biofuels</b> must be fulfilled for <b>75% by biomethane</b> and for <b>25% by other advanced biofuels</b>. The respective shares will be reviewed every two years.</p> <p><b>The Decree applies to production plants starting operations between 2018 and 2022</b>, and to plants already supported under the Ministerial Decree December 5th 2013, that opt for the provisions of the new Decree. The scheme is also open to existing plants for the production of biogas which is converted, partially or totally, in plants for the production of advanced biomethane between 2018 and 2022.</p> <p><b>Only biomethane injected into the natural gas grid can access to the support mechanisms.</b> Grids are all the networks, transport and distribution systems, including: transport and distribution networks of natural gas whose managers have an obligation to connect third parties, other transport networks, transport systems using cylinder trucks, natural gas distributors for transports, even if not connected to the networks of transport and distribution</p>

<sup>12</sup> [Ministerial Decree on the promotion of biomethane and advanced biofuels in transport for the period 2018-2022](#), IEA

		<p>The Decree provides measures for:</p> <ul style="list-style-type: none"> <li>- Biomethane injected into the natural gas grid without a specific intended use;</li> <li>- Guarantees of Origin</li> <li>- Biomethane injected into the natural gas grid to be used in the transport sector</li> <li>- Advanced biomethane injected into the natural gas grid with the obligation to connect third parties to be used in the transport sector</li> <li>- Advanced biofuels, different from biomethane</li> </ul> <p>The biomethane promotion scheme is based on the <b>allocation of certificates of release for consumption</b> ("Certificati di Immissione in Consumo di biocarburanti", better known as "CIC") <b>to be provided by those subjects who release non-renewable fuels for consumption</b>. The number of CIC that they are obliged to hold must be sufficient to cover the share of energy corresponding to the obligation to release for consumption of biofuels, which is determined every year.</p> <p>As a basic rule, one CIC is assigned every 10 GCal of biomethane produced and released for consumption to the producers; the CIC is assigned every 5 GCal if the biomethane derives from biogas produced by particular matrices (Annex 3 to the Ministerial Decree of 10 October 2014).</p> <p>Once an installation has entered into service and has successfully passed the qualification process at the designated public company (GSE - Gestore Servizi Elettrici), the CIC allocation period is not subject to time limits and is available until the compulsory quota mechanism for biofuels is operational.</p> <p>Moreover, the Decree provides incentives for biomethane injected into the natural gas grid and for advanced biofuels to be used in the transport sector.</p>
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### ▪ LITHUANIA

In the National Energy Independence Strategy of Lithuania there are no specific targets for biomethane, however in National Energy Independence Strategy **Action Plan** it is **foreseen to provide financial support for producing biomethane for transport sector from agriculture and non-communal waste**. From 2022, it expected to produce **11,63 GWh of biomethane per year that would be consumed in transport sector**. As well it is foreseen to apply regulatory measures that would increase biomethane usage in transport.

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**Lithuanian gas GoO registry is in place since June 2019** and Amber Grid is designated administrator of this registry. However, **it lacks such functions as self-service**. For what concerns GoO import/export, it is currently limited by national

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legislation and automated cross-border transfer of GoO. **At present, only those Member States GoO with which Lithuania has a direct or indirect gas transmission system connection are recognized in Lithuania.** Such countries today are **Latvia and Estonia.** From **2020** also **Finland will be recognised** and from **2022**, after **grid connection with Poland**, Lithuania will trade with **the rest of Europe.**

Currently, **without subsidies and support schemes** for biomethane production there is no room for biomethane projects. **Biomethane as end product is not competitive** with other energy sources. However, projects where biomethane would be used as a source for **producing subsidized green electricity could be feasible.**

Presently, as there are no supportive schemes for biomethane and no feasible business cases for companies to invest in it (except when using biomethane for electricity), biomethane market uptake could be achieved by providing national producers, consumers and market participants ability to trade renewable gases GOs with other European countries. Therefore, **creating Europe-wide harmonised trading system for GO and establishing clear rules, regulations, procedures and requirements for issuing renewable gases GO would be the key for renewable gases market uptake in Lithuania.** Potential investors in renewable gases production plants would have more confidence in their investment decisions as their produced GOs would be acceptable in all Europe and consumers could import green gases knowing their purchased GOs is reliable. This could be achieved thanks to REGATRACE activities.

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In the following table, an overview on the measures currently in force in Lithuania are reported.

Name	Type	Description
<b>NRA Tariff scheme for biomethane producers</b>	Feed-in Tariff	Feed in Tariff is in place since 2012, but <b>never applied as there are no biomethane production in Lithuania and the tariff scheme has not yet been agreed with EC</b> as part of renewable support scheme.
<b>Law on Renewable Energy of the Republic of Lithuania</b>	-	<b>40% discount for biomethane plant connection fee</b> (to apply which has yet to be agreed with EC as part of renewable support scheme).

### ▪ POLAND

According to the Polish National Energy and Climate Plan (NCEP- 2021-2030), the following targets are set on the share of renewable energy in the gross final energy consumption:

- 15% in 2020
- 21% in 2030

Moreover, national indicative targets for are established for the share of biofuels in the transport sector (Polish Biofuel Act):

- 8,8% in 2022
- 9,1% in 2024
- minimal share of advanced biofuels (RED II definition) 0,1% in 2020

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The Act on biocomponents and liquid biofuels – *amendment 19-07-2019* - introduced, among others, new biofuels like biomethane and biohydrogen for fulfilment of national indicative target (NCW).

Biogas sector has large potential in Poland but due to not stable policy it has not progressed within the last three years.

There is no support to biomethane production at the moment in Poland, however situation is changing.

The decarbonisation of transport and the fulfilment of EU requirements concerning share of RES in transport in RED (10% in 2020) and RED II (advanced biofuels) are the main issues to be addressed in Poland and today there are some difficulties in pursuing and achieving these ambitious objectives that would facilitate the uptake of the Polish biomethane market.

Within REGATRACE, UPEBI will form a group of national stakeholders working on the identification of barriers and methods for promoting and supporting biomethane production and use (gas grids, transport).

Thanks to REGATRACE activities, a national strategy for biomethane market development can be set out with clearly defined targets for biomethane share in next years.

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In the following table, a list of measures in support of biomethane sector in Poland are reported.

Name	Type	Description
<b>Energy Act</b> (amendment from January 2010)	GC	So called “brown certificates” were introduced for agriculture biomethane injected to national gas grid; in practice were not applied as price for green certificates and co-generation certificates was higher so there was no interest in biomethane investment. Moreover, this support has not yet been agreed with EC as part of renewable support scheme.
<b>RES Act</b> (amendments in 2019)	Tender, FiT, FiP	RES Act is the main Polish act defining support system for electricity and heat production from RES as well as agricultural biogas production. There are defined technology baskets and depending on the scale of technology different types of support for 15 years are possible (tender, FiT or FiP). <b>Support system for biomethane</b> production similar to green electricity (auction, FiT, FiP) is planned in the RES Act amendment in 2020.
<b>Tax Act 2019</b>	Fiscal incentives	CNG, LNG, biomethane, biogas, hydrogen – zero excise tax from 14 August 2019 for use as transport fuel
<b>Fund for Low Emission Transport</b>	Investment support	<b>Grants for alternative fuels infrastructure, NGV, support for local authorities</b> investing in clean public transport (rules published 30 -09-2019).
<b>National Framework for Alternative Fuel Infrastructure</b>	-	Definition of alternative fuels including natural gas CNG (biomethane), LNG, LPG, hydrogen etc. <b>Requirements concerning location of alternative fuels infrastructure</b>

<b>Development Policy (2017)</b>		
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▪ **ROMANIA**

Within the Energy Strategy of Romania 2016-2030, with the perspective of 2050, it was stated that:

"Climate and environmental policies, focused on reducing GHG emissions and changing social attitudes in favour of "clean energy", are a determinant factor that shapes national investment behaviour. "<sup>13</sup>

In this regard, the Strategy Document underlines that biomass will play a central role especially in the domestic heating supply sector in the countryside. Dedicated policies will support the use of efficient and less polluting installations, and biomass and biogas cogeneration systems in semi-urban areas. Most of the existing cogeneration plants operate on natural gas, but new capacities will increasingly use biomass and biogas."

For the moment, there is no clear National Strategy for biomethane. Romania is now in the phase of implementing policies for biomass and biogas.

Concerning the biomass market in Romania, the main obstacles for commissioning and operating projects in the field of renewable energy production from biomass have been identified as follows:

- The law on renewable energy in Romania, Law 220/2008, is no longer in force since 31.12.2016 and after that, no other law was issued in support of renewables, including biomethane;
- The limit imposed by the Romanian Government on methane cost within 2019-2022 as a measure of protection against the volatile behaviour of the energy market will create a major unbalance at the end of the period by integrating back into EU fuel price competition;
- Difficulties in the identification of funding sources due to the inexistent or unpredictable legislative national framework that does not allow investors to draw up a coherent business as well as the complicated framework of applications for European funding;
- Unbalanced development in favour of other renewable technologies (e.g. PV plants) with shorter implementation times compared with those in the biomass field;
- Higher capital for investment needed and higher operating costs than similar technologies using fossil fuels;
- Insufficient knowledge of the Authorities in charge of issuing legislation to support renewable projects.

In respect to the EU obligations assumed by Romania with regard to the waste management sector, REGATRACE could boost the "waste to energy" sector which is currently underdeveloped due to the lack of active legislation.

Green transport, by replacing the fossil fuel with biomethane can be another important target to be achieved through REGATRACE activities.

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<sup>13</sup> [http://www.mmediu.ro/app/webroot/uploads/files/2017-03-02\\_Strategia-Energetica-a-Romaniei-2016-2030.pdf](http://www.mmediu.ro/app/webroot/uploads/files/2017-03-02_Strategia-Energetica-a-Romaniei-2016-2030.pdf)

In the following table, a list of measures in support of biomethane sector in Poland are reported.

Name	Type	Description
<p>Government Decision no. 216/2017 regarding the approval of the state aid scheme aimed at supporting investments on promoting the production of energy from less exploited renewable sources, namely biomass, biogas, geothermal energy</p>	<p>Investment support</p>	<p>The implementation of the State aid scheme aims to achieve the European Union's renewable energy production targets set out in Directive 2009/28 / EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources. It aims to increase the share of renewable energy in the total primary energy consumption and to consequently reduce carbon emissions in the atmosphere.</p> <p>Quantitative targets are fixed in the increase of the total installed capacity from biomass, biogas and geothermal by 60 MW (electric and thermal).</p> <p>The state aid scheme applies to investments related to the realization and/or modernization of the production capacities of electric and/or thermal energy from biomass, biogas and geothermal water.</p> <p><b>Eligibility conditions</b></p> <p>Proposed projects must meet the following eligibility conditions:</p> <ol style="list-style-type: none"> <li>1) The project is implemented on the territory of Romania, in the development regions: West, North-West, North-East, South-East, South, South-West, Center.</li> <li>2) The implementation period will not exceed December 31, 2023.</li> <li>3) The investment has not benefited from public funding in the last 5 years before the grant application date, except for preliminary studies (i.e., pre-feasibility study, geotagging, feasibility study, technical project, execution details).</li> </ol> <p><b>Duration of the State aid scheme</b></p> <p>Due the lack of application, the funding scheme has been extended all over 2020.</p> <p><b>Budget</b></p> <p>The total budget of the scheme will be 100.630.588 euro. Potential beneficiaries will be able to request funding once the state aid provider issues the call for project proposals.</p> <p>Of the total allocated budget of the scheme, 85% represent European non-reimbursable funds provided through the European Regional Development Fund and 15% public co-financing funds, provided from the state budget through the budget of the Ministry of Regional Development, Public Administration and European Funds and from the local budget , according to the</p>

		<p>Financial Program of the Large Infrastructure Operational Program ("POIM").  <b>Being the single current financing instrument to support the biomethane project development, the GD 216/2017 can also boost the biomethane market when this will be associated with GoO which can be traded within EU states.</b></p>
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### ▪ SPAIN

In Spain, no policy targets for biomethane sector have been established.

The main barrier in Spain is the lack of support to the development of biomethane market (production and consumption). Thus, it is necessary to implant:

- political and legislative support
- economic/financial mechanisms to support and promote biomethane market: possibility of economic incentives for producers of biomethane to compensate for the difference between the cost of producing biomethane and the cost of conventional natural gas (Feed-in tariffs, Feed-in premiums; Fiscal incentives; Direct subsidies).
- certification system (Guarantees of Origin)

Gas sector tax revenues are implemented for environmental protection (example: green cent in Spain), but they should be used to decarbonize the sector itself, instead the electricity sector as it happens today.

The Government presented a proposal/draft of the Climate Change and Energy Transition in Nov-2018.

In this proposal/draft of the Draft Law, some lines of the framework of action for the promotion of renewable gas are established:

- The Government is empowered to approve support mechanisms for renewable gas. These support mechanisms may be financed with the regulated revenues of the natural gas sector within the limits determined by regulation.
- The Government is empowered to approve support mechanisms and regulations that allow the injection of renewable gases into the natural gas network.
- Within one year, the Government shall approve a system of registration of guarantees of origin for renewable gases injected into the natural gas network.

Draft Law link (article 13 th)

<https://s03.s3c.es/imag/doc/2018-11-15/Anteproyecto-Ley-Cambio-Climatico-Transicion-Energetica.pdf>

Due to all these factors, during REGATRACE it will be possible:

- to highlight that Spain is one EU Member state that does have
  - no political neither legislative policy of supporting biomethane
  - no economic/financial mechanisms to support and promote biomethane market

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- to test the possibility to establish a voluntary registry (seeking our commitment to comply with the ERGR scheme)
- to do the preparatory work for the establishment of the Spanish national registry
- to provide a relevant network and significant knowledge transfer between countries.
- to overcome the economic, technical and administrative barriers to developing the biomethane market

### 6.2 Policy Evaluation Criteria

To proceed with the identification of the most successful policies in each of the countries examined, a set of criteria must be established in order to guarantee measurability and comparability among the different national policy frameworks. Accordingly, five criteria have been set out and defined as reported in Table 8.

AGCS, DENA, ELERING and all the responsible partners from the Target countries will be asked to analyse their national policies according to these criteria, assigning them a score from 1 to 5. As a result, a national ranking from the most to the least successful policy can be obtained country by country.

*Table 8: Policy Evaluation Criteria*

POLICY EVALUATION CRITERIA			
Code	Criteria	Description	Score
<b>C1</b>	<b>Potential for market transformation</b>	Capacity of the policy to enhance the market transformation and to strengthen the biomethane market	<ul style="list-style-type: none"> <li>▪ 5 = very high potential</li> <li>▪ 4 = high potential</li> <li>▪ 3 = medium potential</li> <li>▪ 2 = low potential</li> <li>▪ 1 = very low potential</li> <li>▪ 0 = no potential</li> </ul>
<b>C2</b>	<b>Cost Efficiency</b>	Biomethane production achieved/achievable in relation to the amount of administrative/regulatory/financial resources necessary to support and implement the policy	<ul style="list-style-type: none"> <li>▪ 5 = very efficient</li> <li>▪ 4 = relatively efficient</li> <li>▪ 3 = neutral, balanced relation</li> <li>▪ 2 = less efficient</li> <li>▪ 1 = very poorly efficient</li> <li>▪ 0 = Completely inefficient</li> </ul>
<b>C3</b>	<b>Environmental impact</b>	Amount of CO <sub>2</sub> reduction achieved/achievable by the policy	<ul style="list-style-type: none"> <li>▪ 5 = high impact measure</li> <li>▪ 4 = medium/high impact</li> <li>▪ 3 = medium impact</li> <li>▪ 2 = medium/low impact</li> <li>▪ 1 = low impact</li> <li>▪ 0 = no impact</li> </ul>
<b>C4</b>	<b>Persistency of impacts over time</b>	How lasting is the impact of the policy in terms of time.	<ul style="list-style-type: none"> <li>▪ 5 = very persistent/long-lasting</li> <li>▪ 4 = persistent / lasting</li> <li>▪ 3 = medium persistent/ lasting</li> <li>▪ 2 = low persistency / short-lasting</li> <li>▪ 1 = very low persistency / very short-lasting</li> </ul>

<b>C5</b>	<b>Support of positive side-effects</b>	<p>Positive side-effects or co-benefits of a policy are e.g.: -Higher economic growth, improved competitiveness and productivity -Creation of new jobs, improved work environment - Improvement of energy security, health etc.</p>	<ul style="list-style-type: none"> <li>▪ 0 = no persistency / no -lasting</li> <li>▪ 5 = very high support of positive side-effects</li> <li>▪ 4 = high support of positive side-effects</li> <li>▪ 3 = medium support of positive side-effects</li> <li>▪ 2 = low support of positive side-effects</li> <li>▪ 1 = very low support of positive side-effects</li> <li>▪ 0 = no support of positive side-effects</li> </ul>
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### 6.3 A new methodology for estimating the Replication Potential: MEETS Policy Replicability method

Once identified which are the most successful policies in each country, it is interesting to understand if and to what extent they are replicable in other countries.

The notion of “Replicability” is widely used in the context of Smart Cities and Urban development projects and, according to literature<sup>14</sup>, it refers to the possibility of applying the same solution implemented in a city to a different context with the aim to achieve the same objective. More broadly, replication can be defined as the application of a successful model, approach, strategy, technology, product or **policy** in another location, even completely different. In this regard, it is important to specify that “application” is not intended as the exact copy of the same product/solution/etc. in other contexts, but should rather be understood as its adaptation to a different environment.

That being said, in the context of national policies on biomethane, we will assess the replication potential of national policies taking into account both factors that inherently characterize the policy under assessment and context-dependent factors that are proper of the countries where we want to estimate its replication potential.

This analysis will be carried out through a new methodology developed by ISINNOVA for the estimation of the Replication potential of policies in different contexts. This is still an experimental method and we intend to test and validate it within REGATRACE project.

The method is called **MEETS** and is based on the analysis of 5 specific dimensions:

- **Market**
- **Effectiveness**
- **Ecosystem**
- **Time**
- **Side Effects**

MEETS works with two typologies of variables:

<sup>14</sup> DG ENERGY, [Analysing the potential for widescale roll out of integrated Smart Cities and Communities solutions](#), June 2016

- **Policy variables:** proper of the specific measure/regulation/act under assessment. The values associated to these variables are independent from the context.
- **Context variables:** proper of the countries where we are estimating the replication potential

Therefore, specific Policy and Context variables have been defined and associated to every dimension (listed in Table 9 below and described in-depth in the following). It must be noted that the Policy variables correspond exactly to the Policy Evaluation Criteria defined in the previous paragraph.

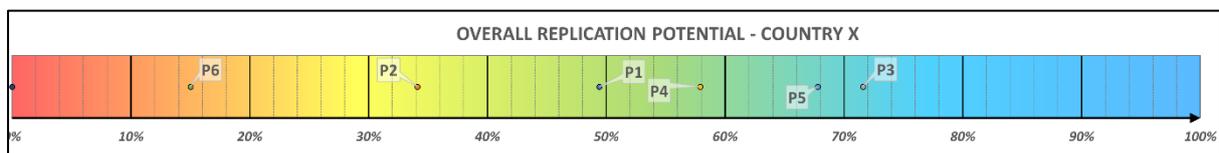
*Table 9: Policy and Context variables in MEETS*

MEETS Dimension	POLICY Variables	CONTEXT Variables
<b>MARKET</b>	Potential for market transformation	Interest from key players to invest in the specific policy
<b>EFFECTIVENESS</b>	Cost Efficiency	Readiness of the regulatory framework
<b>ECOSYSTEM</b>	Environmental impact	Acceptance from relevant stakeholders
<b>TIME</b>	Persistency of impacts over time	Government/Institutional stability
<b>SIDE EFFECTS</b>	Support of positive side-effects	Responsiveness to National Plans /Institutional Priorities

Before going through the rationale behind the method, an overview of the expected outcomes is fundamental and helpful to clearly understand the ambition and the wide application potential. The following figures (Figure 8 and Figure 9) give a first comprehensive overview of how MEETS works.

	MARKET Replication Potential	ECOSYSTEM Replication Potential	EFFECTIVENESS Replication Potential	TIME Replication Potential	SIDE EFFECTS Replication Potential	OVERALL REPLICATION POTENTIAL
Policy 1	?	?	?	?	?	?
Policy 2	?	?	?	?	?	?
Policy 3	?	?	?	?	?	?
Policy 4	?	?	?	?	?	?
Policy 5	?	?	?	?	?	?
Policy 6	?	?	?	?	?	?

*Figure 8: MEETS expected results – Overall Replication Potential*



*Figure 9: Policies Ranking*

Given a certain number of policies, the method calculates the corresponding replication potential (%) for every single dimension (Figure 8). The five values obtained are then averaged<sup>15</sup> to get the Overall Replication Potential of that given policy (issued in one of the advanced countries) in the specific context (one of the target countries) under assessment, leading to a ranking from the most to the least replicable policies (Figure 9).

<sup>15</sup> Simple or weighted average.

This exercise makes it possible to identify those biomethane-related policies that could be best replicated in the REGATRACE Target countries according to characteristics and factors proper of their national context.

### 6.3.1 The approach

Replicability is, thus, the result of specific assumptions and intricate correlations among several dimensions and variables.

The mathematical approach adopted in MEETS allows to break down this complex analysis into multiple elements that can be easily understood and graphically displayed through cartesian diagrams whose variables are dependent both on specific factors proper of the policy (horizontal axis) and on local factors relevant for the context (vertical axis).

Accordingly, every policy can be represented as a point in the diagram (Figure 10a).

To establish a correlation between policy variables, context variables and replicability potential, a third axis is introduced (Figure 10b). The intersection between the points representing the policies and the *iso-replicability* lines (diagonal lines in Figure 10b) determines their replication potential, expressed on a scale 0-100%.

This approach is likewise applied for every MEETS dimension.

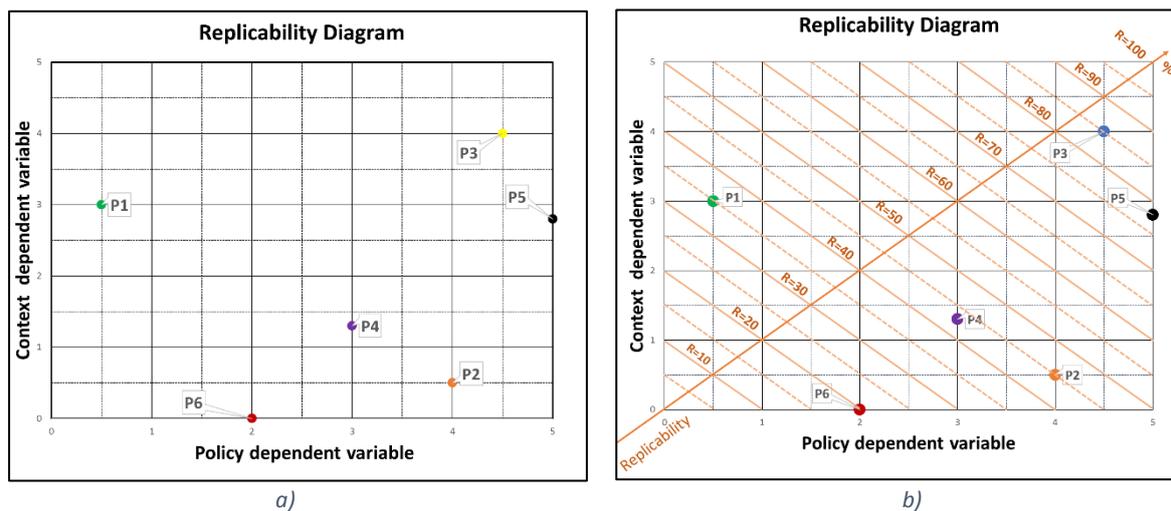


Figure 10: Replicability Diagram

The values related to the policy variables are elicited from experts' estimations of "Advanced" countries, while the values of the context variables are assigned by representatives from Target Countries. A specific questionnaire will be prepared and distributed to collect those inputs.

### 6.3.2 The MARKET dimension

The suitability of a policy to enhance the market transformation and to strengthen the biomethane market is one of the criteria determining its success. Additionally, the national-administration interests as well as the major industry players and private investors perspectives play a key role. Actually, the deployment of a policy strategy, especially if complex, requires a firmer engagement of both public and private sectors. In other terms, when industry, academia, institutional players, private businesses, etc., collaborate, they significantly contribute to the creation of the right conditions to effectively introduce and apply a policy. This is even more true when the interest from the key players is expressed as economic interest to invest in the sector.

According to that, the Replicability Diagram of the Market dimension of MEETS is built on the following variables (see the diagram in Figure 11):

- *Potential for market transformation* (horizontal axis): It is an intrinsic characteristic of the policy and does not vary if the context changes. This indicator can assume values from 0, no potential, to 5, very high potential. The more the policy is able to force market transformation, the more it is likely to have success and, thus, be replicated.
- *Interest from Industry/Private/Institutions to invest in the policy* (vertical axis): the higher the interest of investors, the higher the chances to replicate and apply the policy.

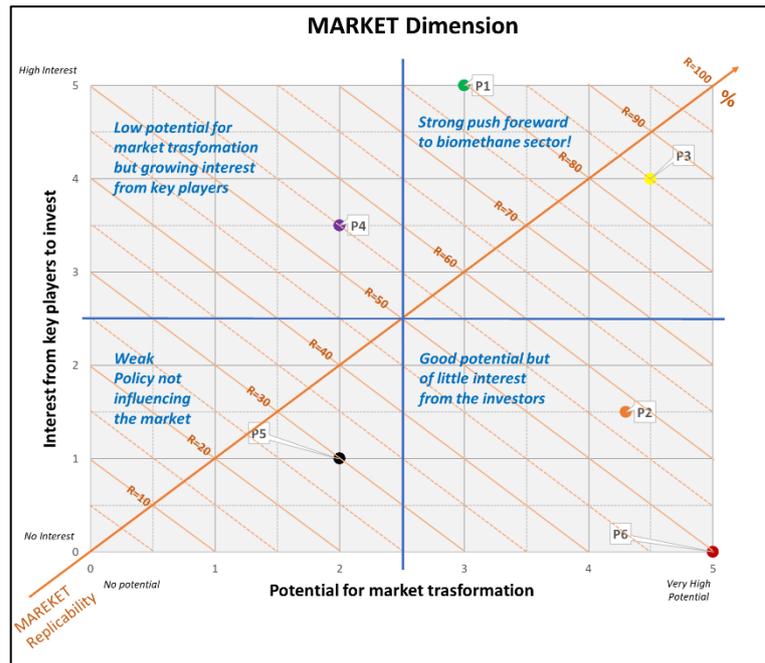


Figure 11: MARKET Replicability Diagram

In the example reported in Figure 11, it is evident how P3 is the policy with the highest Market Replication potential (85%) and it could be, for example<sup>16</sup>, a strong policy fixing ambitious targets and providing incentives for biomethane injection into the grid, that is concurrently considered strategical by the major investors of the hypothetical country under assessment. On the other hand, P2 has about the same potential for transforming the market but is not considered beneficial and interesting by all the relevant stakeholders. This could be the case, for example, of an incentive scheme promoting the use of biomethane in the transport sector that may conflicts with the interests of the automotive industry or other key national players of non-biomethane sectors affected by that policy. Accordingly, its MARKET replication potential is lower than P3 (45%).

As can be seen, it is already possible to rank policies from the most to the least replicable, but it is necessary to take into account the other four dimensions before drawing general conclusions. However, from these partial results, it is possible to get a first idea on the Legislation framework and on the potential barriers and/or enablers to the adoption of a specific policy in the country addressed. The same analysis can be done for each of the MEETS dimensions.

### 6.3.3 The Effectiveness dimension

There is no need to emphasize how economic and legislative aspects are key and decisive elements for the identification of the best policies to replicate.

<sup>16</sup> All these examples are just fictitious illustrations that have no reference to any real context or situation but are provided just for the sake of simplification.

Understanding what are the costs and the efforts required for the implementation of a given policy and assessing its effectiveness in relation to the expected results (e.g. increase in the production of biomethane) is a fundamental step for an initial feasibility assessment.

However, there's no guarantee that a very efficient policy would be easily applicable to every context and regulatory framework in force in a given country. It is for this reason that it is necessary to evaluate the extent to which the regulatory structure of a country is able to accept and integrate a certain policy and eventually adjust it so that it does not conflict with other policies already in force.

According to that, the EFFECTIVENESS Replicability diagram depends on the following variables (Figure 12):

- **Cost Efficiency** (horizontal axis): it is a qualitative estimation (0-5) of the efficiency of a policy considering the increase in the biomethane production stemming from its adoption and application in relation with costs and efforts necessary to implement it by the relevant bodies involved.
- **Readiness of the regulatory framework** (vertical axis): this is an estimation of the level of integrability of the policy with the existing regulatory framework of the reference country under assessment. High values mean that the regulatory context is flexible enough to easily embed the policy in the national regulation system.

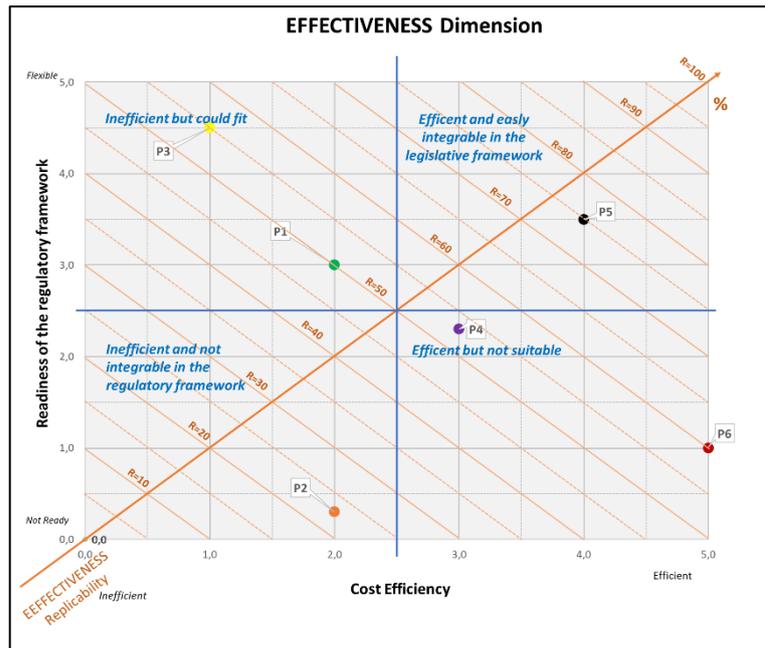


Figure 12: EFFECTIVENESS Replicability Diagram

The more a policy is efficient and easily integrable with the national regulation context, the higher the replication potential.

#### 6.3.4 The ECOSYSTEM dimension

For ECOSYSTEM we intend both the natural and the social environment that characterizes the context where we live and that we cannot ignore if we want to analyse the effects that a given policy (such as a measure supporting biomethane) may have, once applied.

Environmental variables play an important role in the sustainability policy context and constitute a crucial factor that might influence the choice of a policy over another. Thus, comparing the environmental impacts generated by several (even similar) policies can have great leverage on potential replication and contributes to facilitate the prioritization process.

Environmental impacts aside, the extent to which a specific policy is accepted by the relevant stakeholders and key players of biomethane and other involved sectors (producers, consumers, network operators, inhabitants, farmers, energy utilities, cities administrators, etc.) represent an important factor affecting replicability.

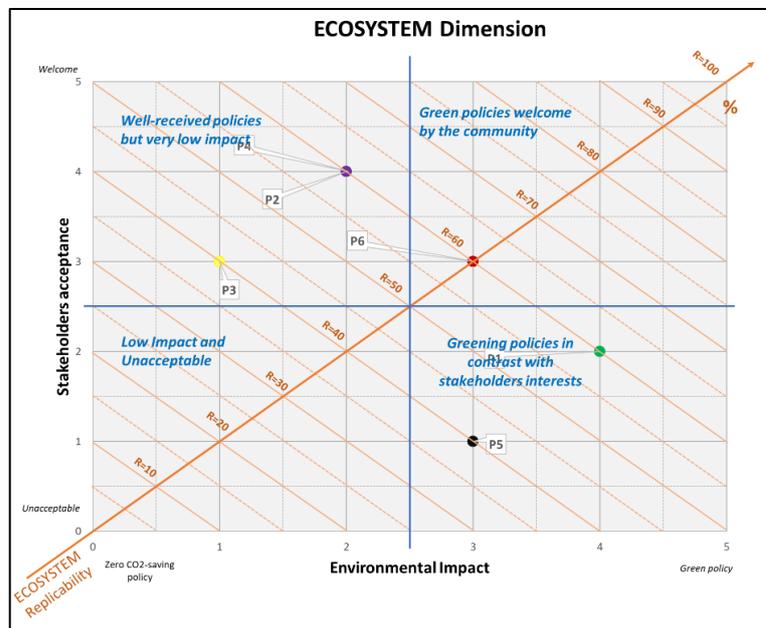


Figure 13: ECOSYSTEM Replicability Diagram

Keeping both these aspects into consideration, while thinking at the potential replicability of a policy, is fundamental. It is for these reasons that the concept of ECOSYSTEM Replicability gains an important meaning which is addressed in MEETS through the following variables (Figure 13):

- *Environmental impact* (horizontal axis): amount of CO2 reduction achieved/achievable by the policy. Higher values correspond to greener policies.
- *Acceptance from relevant stakeholders* (vertical axis): The higher the “acceptance” level, the higher the ECOSYSTEM replication potential is.

ECOSYSTEM Replication is higher when emissions saved are large and the actions prescribed by the policy are well received by the community.

### 6.3.5 The TIME dimension

To assess the effectiveness of a sustainability policy, it comes naturally thinking at environmental impacts and to what extent it facilitates and increases those effects (see ECOSYSTEM dimension). However, this kind of evaluation, although reasonable, is not enough to provide a complete and exhaustive picture of the direct impacts deriving from a given policy.

Thus, the temporal dimension plays an important role and adds value to the aforementioned ecosystem analysis. A policy determining a huge impact in terms of CO2 savings, can lose effectiveness over the years if not properly updated or if utterly forgotten in the transition from one government to another.

For these reasons, the TIME dimension is regarded as worthwhile as the others in MEETS and relies on the following variables (Figure 14):

- *Persistency of the impacts over time* (horizontal axis): the more the policy implies long lasting effects, the more it is worth to replicate it.
- *Government Stability* (vertical axis): it is related to the government durability and frequency of regime transitions. The more a country is likely to change government, the lower is the potential for successful replicability of a policy, even if with highly persistent effects.

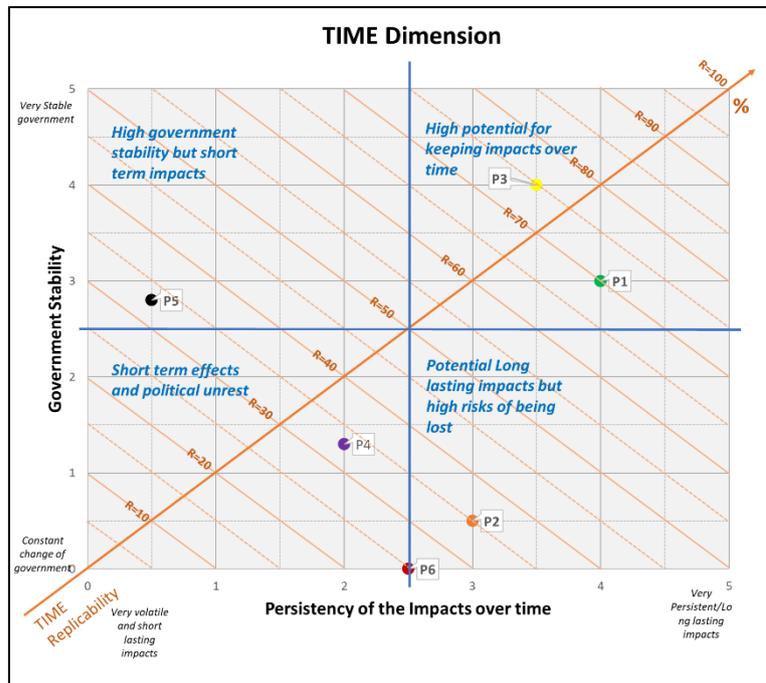


Figure 14: TIME Replicability Diagram

6.3.6 The SIDE-EFFECTS dimension

A Side Effect is an effect that is secondary to the one intended. More in general, “Side effect” is synonymous with “externality” and is related to the cost or benefit that affects a party who did not choose to incur that cost or benefit. Although the term is predominantly employed to describe adverse effects, it can also apply to beneficial, but unintended, consequences of a specific action.

Within the scope of this analysis, we focus on positive side-effects or co-benefits that could attain from the application of specific biomethane-related measures, e.g.: higher economic growth, improved competitiveness and productivity of other sectors other

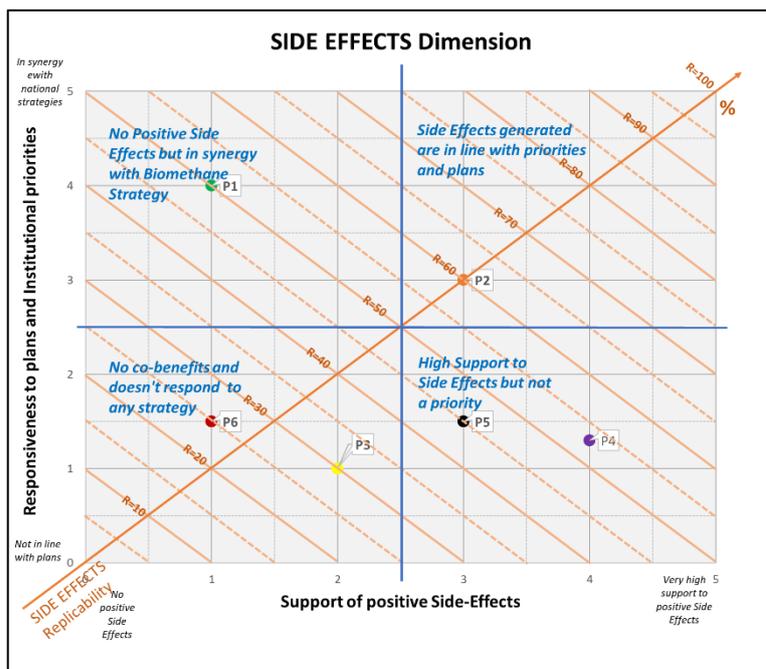


Figure 15: SIDE EFFECTS Replicability Diagram

than biomethane; creation of new jobs; improved work environment; improvement of energy security, health, etc.

The potential of a certain policy, regarded as successful in a given country, to generate positive externalities cannot be a factor of replicability by itself. Therefore, to ascertain how the side effects of that policy are in synergy with the plans in force (national, regional or municipal) in the country where to assess replication, as well as to understand to what extent these respond to institutional priorities set out by previously defined political strategies, is fundamental.

Therefore, the SIDE EFFECTS dimension is built on the following variables (Figure 15):

- *Support of positive Side-Effects (x-axis):* the extent to which the policy brings benefits other than those directly linked to biomethane sector.
- *Responsiveness to Plans and Institutional Priorities (y-axis):* high values mean that the policy and the consequent positive side effects are among the top political priorities set out in the national strategies.

### 6.3.7 Application in REGATRACE

As previously shown, MEETS allows to derive a prioritization of policies for a given country. Besides, it is interesting to see how the assessment of the same group of policies can lead to different results depending on the countries where the replication potential is to be calculated. Therefore, sensitivity analyses can be carried out considering different countries with different characteristics and needs.

In Figure 16 and Figure 17, examples of results are reported for two different countries. By varying the values of the context variables (y-axis) while keeping the policy variables (x-axis) unchanged, it is evident how the method leads to completely different results and an accurate comparison between countries' possibilities and capacities to welcome, integrate and implement the same specific policy can be conducted.

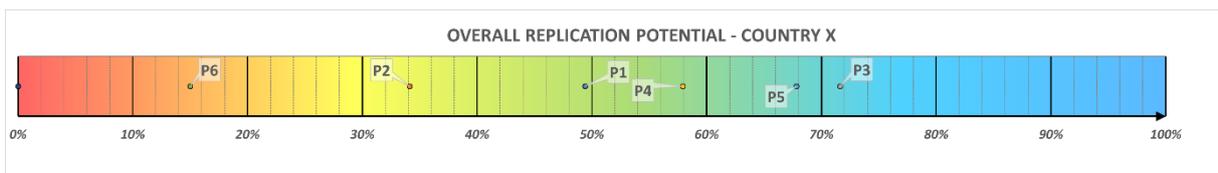


Figure 16: Overall Replication Potential- Country X

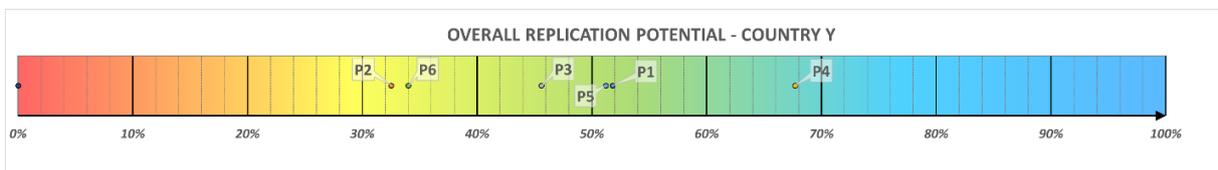


Figure 17: Overall Replication Potential – Country Y

In the REGATRACE project, there will be the opportunity to test MEETS methodology and perform this kind of comparison by involving Target countries in the assessment of the replication potential of a number of biomethane policies developed in the Advanced countries.

Through this analysis, MEETS will provide an interesting and useful interpretation of the main determinants for the possible success or failure of the selected policies by addressing and highlighting the inevitable differences between countries, with the ambition to support political decisions and strategic planning.

