GREENMEUP

Enhancing the uptake of biomethane in Europe

ΚΑΠΕ CRES

Policy workshop

Policy design in EU´s emergent markets: results from target country analysis in GreenMeUp

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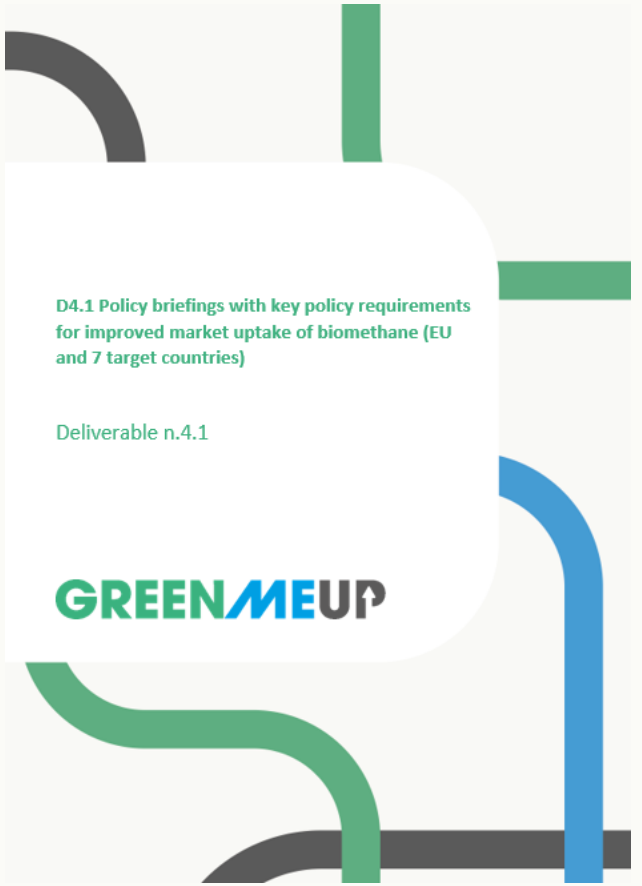
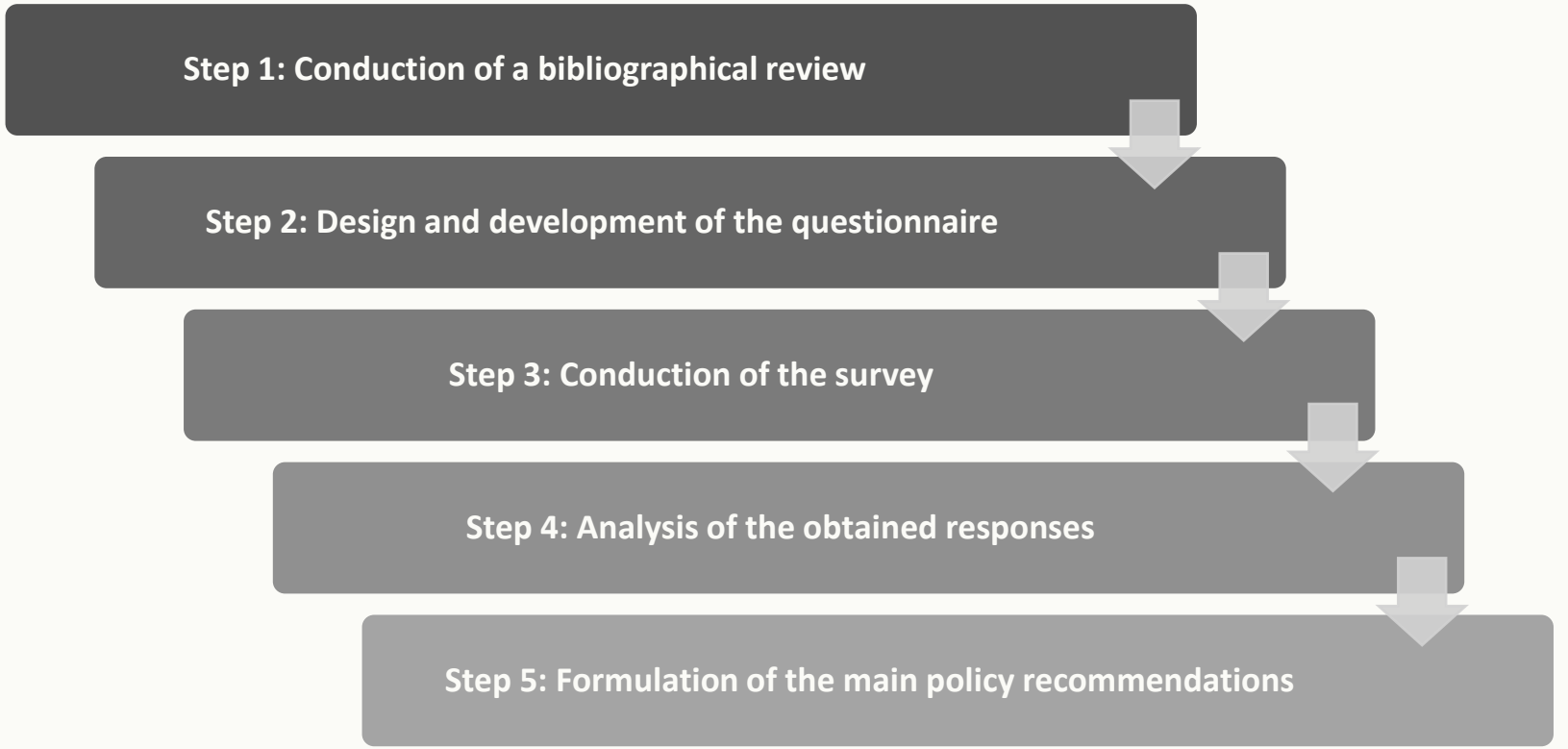
Key policy requirements for improved market uptake of biomethane

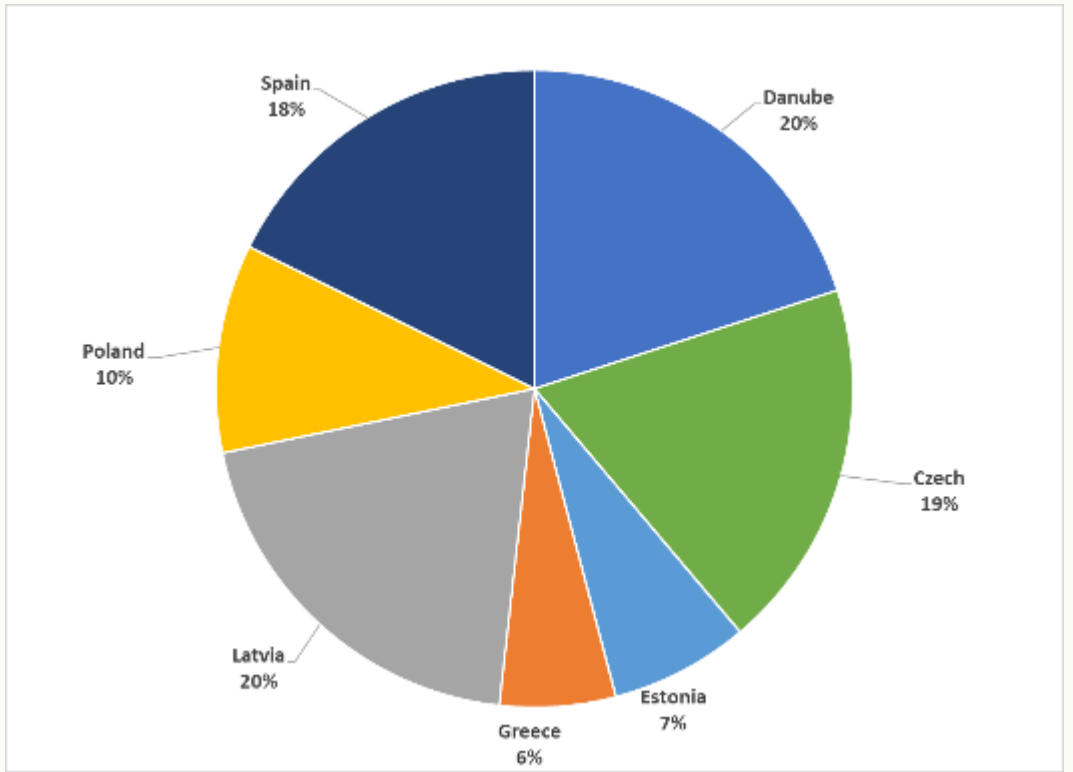


Methodological approach

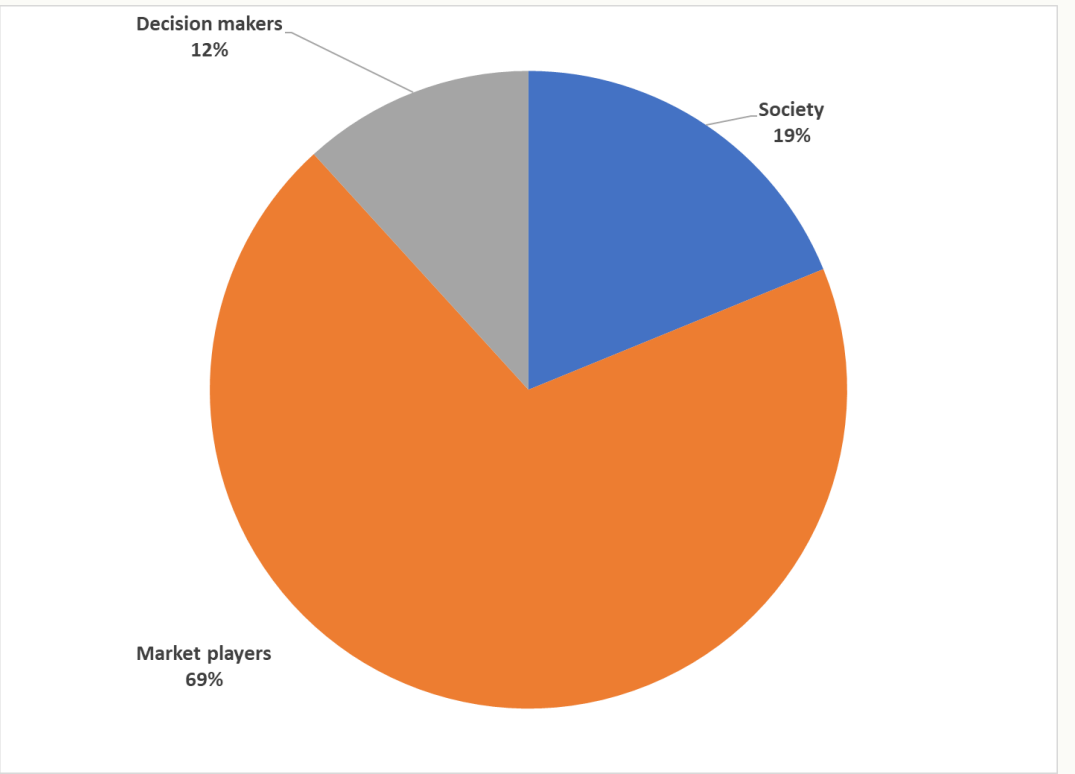


Conducted survey

Allocation of the collected questionnaires to the different countries



Allocation of the collected questionnaires to the different categories of stakeholders



85 stakeholders participate into the conducted survey representing seven countries

Main conclusions

Production side:

- Facilitate the effective **exploitation of the agricultural residues**, which is the most prevalent feedstock type for biomethane production.
- Focus also on the **utilization of industrial wastes**, organic municipal solid waste and sewage for biomethane.
- Promote the **utilization of membrane separation as the most prevalent upgrading technology** for biomethane production.
- Support the **maturation and commercialization of other innovative upgrading technologies** (e.g., pressure swing adsorption, water scrubbing and cryogenic separation).
- Facilitate the **injection of the biomethane into the distribution grid**.
- Enable both the **injection of the biomethane into the transportation grid and the mobilization of off-grid applications**.
- Ensure the **sustainable supply of feedstocks on a long-term basis**.
- Ensure the **acquisition of the environmental data for biomethane technologies**.
- Handle the **potential odor and flying insects' complaints** with transparency and arguments.

Main conclusions

Policy and demand side:

- Promote **biomethane in order to fulfil 2030's energy and climate targets** in all countries.
- Continue the **massive penetration of biomethane until 2050**.
- Foster the **penetration BioLNG-BioCNG and bioH_2 until 2030**.
- Prioritize the **production of BioLNG-BioCNG and bioH_2 along with the biomethane after 2030**.
- Communicate with a coordinated approach all the **unquestionable benefits triggered by the biomethane production and consumption**.
- Focus on the **delivered benefits due to the increased waste management and the exploitation of the various by-products**.
- Design measures so as to **address the main technical barriers** (e.g., the infrastructural challenges and the poor collection, improper segregation, lack of vehicles and adequate waste transportation).
- Reinforce the **existing level of knowledge and the skills of the technical staff** with the provision of dedicated technical training.

Main conclusions

Policy and demand side:

- Launch **financial instruments to confront the main economic barriers** (e.g. the high investment cost, the lack of subsidies and financial support programmes on a long-term basis and the high cost to interconnect small biogas projects to natural gas pipeline).
- Address **the main market barriers** (e.g., the high price of biogas/biomethane, the uncertainties and regulatory hurdles related to injection of biogas into the grid and the large amount of waste feedstocks that is currently not being separately collected and diverted for processing).
- Establish a **coordinated policy-making framework across agriculture, waste management, energy and transport**.
- Ensure the **continuous political support** for the promotion of biomethane and avoid the adoption of the initiation of a fragmented and conflicting legislative framework.
- Reduce the **bureaucracy** during the construction and operation of the biomethane plants.
- **Co-design the required policies and measures** with the organization of public consultation procedures so as to increase the interest of the end-users.

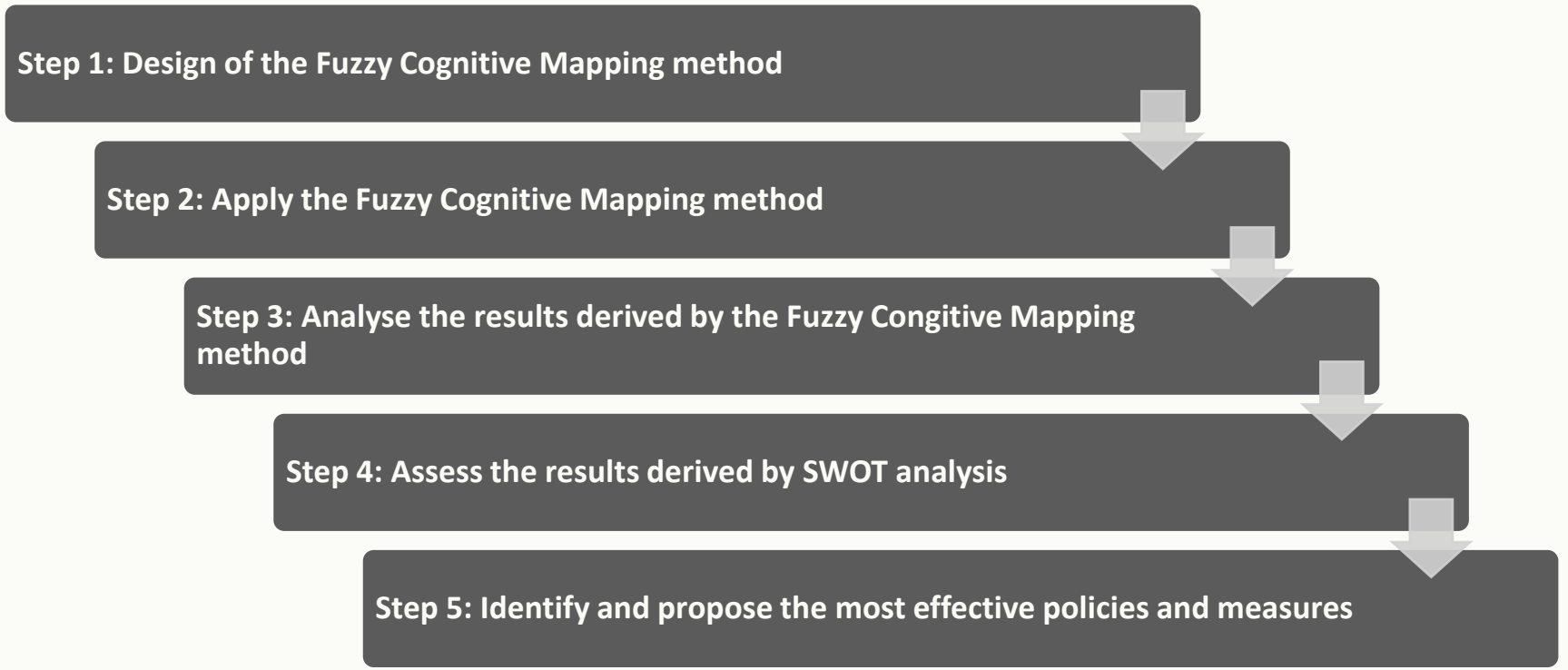
Main conclusions

Policy and demand side:

- Enhance the **existing level of knowledge and the public awareness**.
- **Internalize the environmental benefits into the fuel prices** so as to improve the competitiveness of the biomethane compared to the fossil fuels.
- Expand the type of use so as to include additionally to the replacement of the natural gas from the grid **alternative uses**, such as indicatively to use bio-CNG or bio-LNG as transport fuels, to produce heat and/or steam, to exploit the recycled fertilizers and to produce branding agricultural products with a carbon-neutral label.
- **Adopt stricter CO_2 emission and RES targets at national level** than those are foreseen at European level accompanied by targeted feedstock management, digestate and biogas utilization policies.

Market uptake measures at national level (7 target countries)

Methodological approach



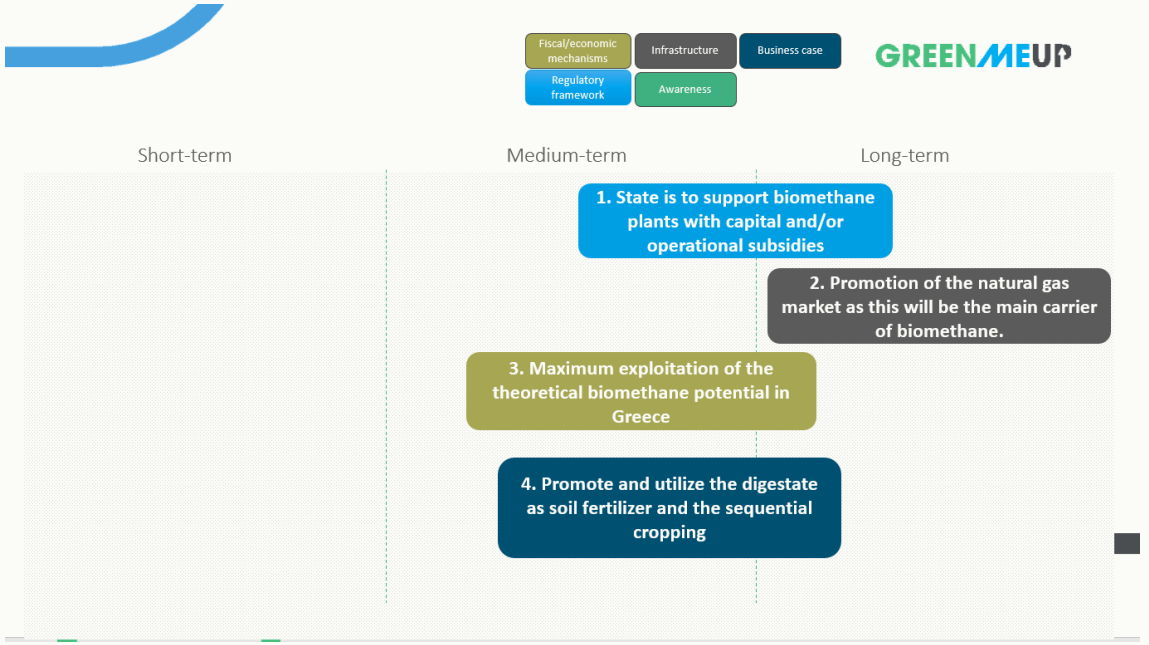
68 stakeholders participated into the application of the Fuzzy Congitive Mapping method identifying 323 concepts, which are related to the further penetration of biomethane

Methodology of Fuzzy Cognitive Maps (FCM)

- FCM is a procedure to **involve stakeholders** in research processes and a **method to extract and analyze different kinds of knowledge** about complex systems and their functioning.
- FCM structures a process in which the **perception of stakeholders** on a certain system is uncovered and a representation of the system is created.
- A **fuzzy cognitive map** is created during the interview phase and consists of a number of elements (concepts/nodes/factors) and their causal influences on each other depicted with weighted arrows between the elements.
- The goal of FCM analysis is **detecting and interpreting relations between elements** found in a map and understanding its structural properties and dynamics.
- It can be used to **simulate the changes of a system** over time and address "what if" questions.

Results in Greece

Results of the applied SWOT analysis



Results of the applied Fuzzy Cognitive Mapping

Concepts	Centrality	Outdegree	Indegree
Development of biomethane market	5.83	0.05	5.78
Raw materials	2.02	1.22	0.80
Social acceptance	1.28	0.63	0.65
Location of units	1.10	0.78	0.32
Waste management	0.95	0.73	0.22
National Strategy and legislation	0.85	0.85	0.00
Licensing of units	0.83	0.48	0.35
Investment support scheme	0.75	0.42	0.33
Financial incentives	0.75	0.62	0.13
By-product management	0.75	0.47	0.28
Supply chain	0.72	0.22	0.50
Operational support scheme	0.70	0.45	0.25
Availability and collection of raw material	0.63	0.42	0.22
Consumer awareness campaign	0.60	0.35	0.25
Environmental impact of units	0.53	0.37	0.17
Legal framework	0.43	0.30	0.13
Problem solving for biogas production	0.40	0.23	0.17
Demand increase in the final consumption sectors	0.33	0.13	0.20
Disposal of digested residue	0.30	0.25	0.05
Legal framework for waste/biomass management	0.27	0.22	0.05
Virtual liquefaction	0.25	0.25	0.00
Staffing and organization of services for the licensing and control of the operation of units	0.23	0.13	0.10
Cost of gas network connection and use	0.23	0.15	0.08
Proper utilization (not electricity production)	0.23	0.15	0.08
Targets	0.22	0.13	0.08

Proposed policies and measures in Greece

Policy measure No1 **Assessing the feedstock potential**

- Assess the sustainable feedstock potential
- Identify and incentivise the untapped feedstock potential
- Map the targeted feedstock potential

Policy measure No2 **Raising awareness with capacity building activities**

- Conduct capacity building activities to increase the existing level of knowledge
- Understand and disseminate economic, social and environmental benefits and risks
- Facilitate the technology transfer and provide trainings to the respective professionals

Policy measure No3 **Establishing efficient permitting and spatial procedures**

- Simplify and streamline the permitting procedures to reduce the length and the bureaucracy
- Conduct spatial gas grid planning based on the mapping of biomethane production potential

Policy measure No4 **Introducing financial support measures**

- Define and introduce financial support measures for the production of biomethane (e.g. indicatively subsidies, fiscal measures, CfDs etc.)

Policy measure No5 **Adopting the regulatory framework for waste management**

- Design and adopt a long-term regulatory and legal framework for the targeted exploitation of available wastes

Policy measure No6 **Fostering the exploitation of the by-products**

- Design targeted regulatory and economic measures for the exploitation of the available by-products
- Promote the use of digestate as soil fertilizer

Policy measure No7 **Establishing the required supply chains**

- Stimulate and support the development of a reliable and competitive equipment supply chain
- Provide training to the involved stakeholders to improve their skills and to ensure quality

Policy measure No8 **Drafting a strategy and adopting the required legislation**

- Formulate a dedicated strategy for the further penetration of biomethane with specific targets and policies
- Adopt the required legislation for achieving the specified targets

Synopsis of the proposed policies and measures in the examined countries

Czech Republic	Danube Region	Estonia	Greece	Latvia	Poland	Spain
PM1: Introducing financial support measures	**PM1: Promoting a holistic framework for cooperation and dialogue**	**PM1: Formulating a vision for the promotion of biomethane**	**PM1: Assessing the feedstock potential**	PM1: Ensuring political and regulatory stability	**PM1: Exploiting the feedstock potential**	**PM1: Introducing financial support measures**
PM2: Accelerating the adoption of the legislative improvements	**PM2: Drafting a strategy and adopting the required legislation**	**PM2: Introducing financial support measures**	**PM2: Raising awareness with capacity building activities**	**PM2: Drafting a roadmap and adopting the required legislation**	**PM2: Introducing financial support measures**	PM2: Integrating positive externalities into the decision-making
PM3: Ensuring political stability	**PM3: Establishing the required supply chains**	PM3: Fostering the consumption side	PM3: Establishing efficient permitting and spatial procedures	**PM3: Introducing financial support measures**	PM3: Promoting waste management	PM3: Fostering the consumption side with targeted incentives
PM4: Decreasing administrative complexity and bureaucracy	**PM4: Raising awareness with capacity building activities**	PM4: Promoting digestate based biofertilizer production	**PM4: Introducing financial support measures**	**PM4: Assessing and increasing the feedstock potential**	PM4: Fostering the consumption side	**PM4: Adopting the regulatory framework for the by-products**
PM5: Exploiting the available feedstock potential	**PM5: Harmonising/enabling the regulatory framework**	PM5: Reinforcing the implementation of the public procurement procedures	**PM5: Adopting the regulatory framework for waste management**	PM5: Fostering the consumption side with targeted incentives	**PM5: Improving the legislative framework**	**PM5: Drafting a roadmap and adopting the required legislation**
PM6: Capitalizing the experienced staff and the supplier companies	**PM6: Introducing financial support measures**	**PM6: Raising awareness with capacity building activities**	PM6: Fostering the exploitation of the by-products	PM6: Developing the required infrastructure	**PM6: Setting more ambitious targets**	**PM6: Promoting a common framework for cooperation and dialogue**
PM7: Increasing the ambition of the specified targets	**PM7: Assessing the feedstock potential**	**PM7: Strengthening the role of the policy makers**	**PM7: Establishing the required supply chains**	**PM7: Raising awareness with capacity building activities**		
	PM8: Promoting the use of bio-CNG/bio-LNG		**PM8: Drafting a strategy and adopting the required legislation**			

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Thank you for your attention ….

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