WORLD BIOGAS ASSOCIATION

Genia global energy

Treating food waste in Europe:

Sharing experiences and preparing for separate collection by 2023

Javier Cervera Alonso. GENIA GLOBAL ENERGY

How is being managed the organic waste in SPAIN, and ways to promote biogas

Targets

The European Circular Economy Package ("CEP")

- Directive 2018/851 of May 30, 2018 **WASTE MANAGEMENT**

'(c) by 2025, the preparing for re-use and the recycling of municipal waste shall be increased to a minimum of 55 % by weight;

(d) by 2030, the preparing for re-use and the recycling of municipal waste shall be increased to a minimum of 60 % by weight;

(e) by 2035, the preparing for re-use and the recycling of municipal waste shall be increased to a minimum of 65 % by weight.';

Recycling targets for municipal waste:

By 2025	By 2030	By 2035
55%	60%	65%

Targets

'Article 22

Bio-waste

1. Member States shall ensure that, by 31 December 2023 and subject to Article 10(2) and (3), bio-waste is either separated and recycled at source, or is collected separately and is not mixed with other types of waste.

Member States may allow waste with similar biodegradability and compostability properties which complies with relevant European standards or any equivalent national standards for packaging recoverable through composting and biodegradation, to be collected together with bio-waste.

2. Member States shall take measures in accordance with Articles 4 and 13, to:

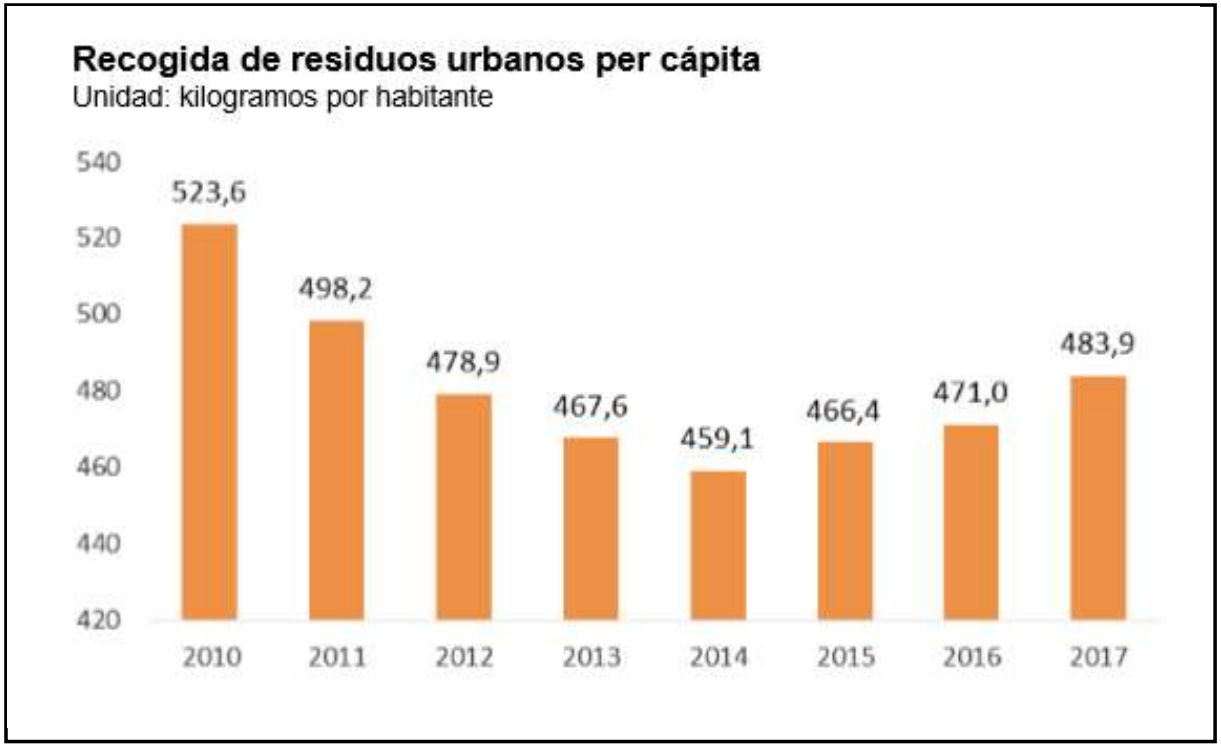
(a) encourage the recycling, including composting and digestion, of bio-waste in a way that fulfils a high level of environment protection and results in output which meets relevant high-quality standards;

(b) encourage home composting; and

(c) promote the use of materials produced from bio-waste.

Spanish situation

Municipal Waste



What we do with it?

Genia bio energy

Fuentes:
Eurostat, EPRS, Comisión Europea

europarl.eu

Municipal waste: EU targets and situation in member states

Target for the reuse and recycling for household waste for 2025

≥55%

Target for the landfilling of municipal waste by 2035

≤10%

Data from 2016	Municipal waste generated (kg/capita)	Share of recycling and composting	Share of landfill disposal
EU28	**482**	47%	25%
Denmark	**777**	48%	1%
Malta	**647**	8%	92%
Cyprus	**640**	19%	81%
Germany	**626**	66%	1%
Luxembourg	**614**	48%	17%
Ireland*	**567**	42%	22%
Austria	**564**	59%	3%
Netherlands	**520**	53%	1%
France	**510**	42%	22%
Finland	**504**	42%	3%
Greece	**497**	17%	82%
Italy	**497**	51%	28%
United Kingdom*	**482**	45%	28%
Portugal*	**453**	30%	49%

x2.3

Data from 2016	Municipal waste generated (kg/capita)	Share of recycling and composting	Share of landfill disposal
Portugal*	**453**	30%	49%
Slovenia**	**449**	58%	24%
Lithuania	**444**	50%	31%
Spain	**443**	30%	57%
Sweden	**443**	49%	1%
Belgium	**420**	54%	1%
Latvia	**410**	28%	72%
Bulgaria	**404**	32%	64%
Croatia	**403**	21%	78%
Hungary	**379**	35%	51%
Estonia	**376**	32%	12%
Slovakia	**348**	23%	66%
Czech Republic	**339**	34%	50%
Poland	**307**	44%	37%
Romania	**261**	15%	80%

Spanish situation

Spanish municipal waste

Source (2017): ecoembes

Spanish situation

Spanish municipal waste

CANTIDAD DE RESIDUOS DE COMPETENCIA MUNICIPAL RECOGIDOS EN ESPAÑA. 2017

Código LER - RESIDUO		Generación	Reciclado	Compostaje	Vertido	Incineración
20 03 01	Mezclas de residuos municipales	17.457.709	660.153	3.307.618	10.840.858	2.649.080
20 01 01	Papel y cartón	1.061.380	1.061.380	0	0	0
20 01 02	Vidrio	13.176	13.176	0	0	0
20 01 08	Residuos biodegradables de cocinas y restaurantes	610.043	0	443.046	105.115	61.882
20 02 01	Residuos biodegradables de parques y jardines	266.779	0	167.371	87.883	11.525
15 01 06	Envases mezclados	660.932	471.525		148.591	40.816
15 01 07	Envases de vidrio	802.706	802.706			
20 01 40	Residuos metálicos	20.940	20.925	0	15	0
20 01 39	Residuos de plástico	24.571	17.337	0	6.573	661
20 01 38	Residuos de madera	189.733	166.050	0	2.878	20.805
20 01 10 20 01 11	Residuos textiles	39.235	24.047	0	14.395	793
20 01 21 20 01 23 20 01 35 20 01 36	Equipos desechados	54.599	48.264	0	6.335	0
20 01 33 20 01 34	Residuos de pilas y acumuladores	1.780	1.780	0	0	0
20 03 02 20 03 07	Residuos de mercados Residuos voluminosos	814.281	745.594	0	50.774	17.913
20 02 02	Tierras y piedras de parques y jardines	0	0	0	0	0
TOTAL		**22.017.864**	**4.032.938**	**3.918.035**	**11.263.416**	**2.803.475**
%			**18,3**	**17,8**	**51,2**	

Source (2017)

17.457.709 Tn

Compost & biomethanization

3.307.618 Tn

19%

18,9 % vs 

(potencial)

Landfill disposal

51,2% (2017) vs **57%** (2016)

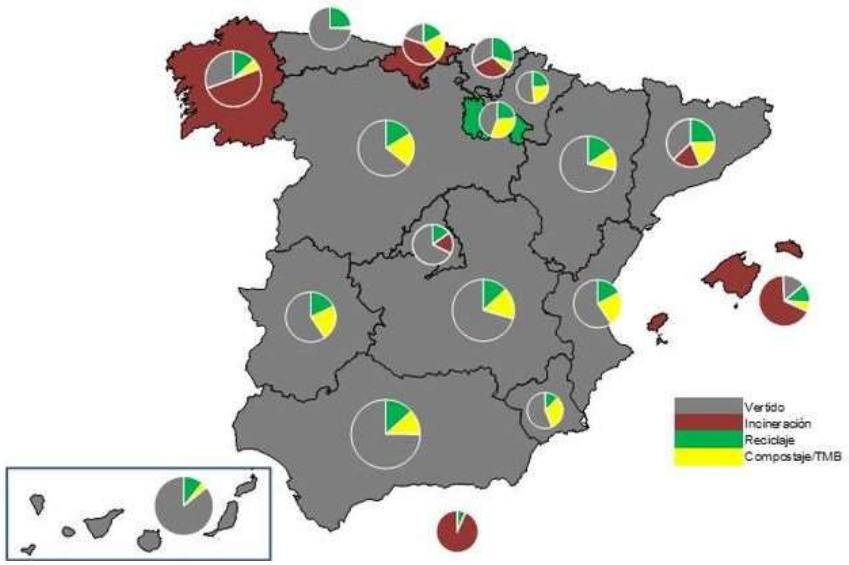
Spanish situation

Spanish municipal waste

27 facilities generating biogas with partly ornagic waste

Different municipal waste treatment facilities

Instalaciones de tratamiento de residuos de competencia municipal	Nº de instalaciones	Entrada (t/año)
Instalaciones de clasificación de envases	92	565.736
Instalaciones de triaje	6	1.037.233
Instalaciones de compostaje de fracción orgánica recogida separadamente	40	431.421
Instalaciones de triaje y compostaje	68	7.567.031
Instalaciones de triaje, biometanización y compostaje de fracción orgánica recogida separadamente	5	244.617
Instalaciones de triaje, biometanización y compostaje	22	3.139.667
Instalaciones de incineración*	10	1.855.398
Vertederos*	130	11.963.503



80 of 130 landfills obtain biogas.

484.530.000 Nm3

Spanish situation

Spanish municipal waste

Instalaciones de tratamiento de residuos de competencia municipal	Nº de instalaciones	Entrada (t/año)
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Biomethanation Potential getting all organic waste

	Potencial Biogás (Nm^3/h)	Potencial Biometano (Nm^3/h)	Potencial Energético anual (GWh)	Potencial Energético anual (bcm)	Turismos Equiv.	Viviendas Equiv.	Emisiones Equiv. GN ($tonCO_2$)	Emisiones Equiv. Diésel ($tonCO_2$)
TOTAL	194.220	101.480	8.854,1	0,757	651.035	1.264.869	1.781.795	2.352.883

2,5% natural gas demand

Spanish situation

Spanish municipal waste

Potential	Potencial Biogás (Nm^3/h)	Potencial Biometano (Nm^3/h)	Potencial Energético anual (GWh)	Potencial Energético anual (bcm)	Turismos Equiv.	Viviendas Equiv.	Emisiones Equiv. GN ($tonCO_2$)	Emisiones Equiv. Diésel ($tonCO_2$)
TOTAL	194.220	101.480	8.854,1	0,757	651.035	1.264.869	1.781.795	2.352.883

8,7%

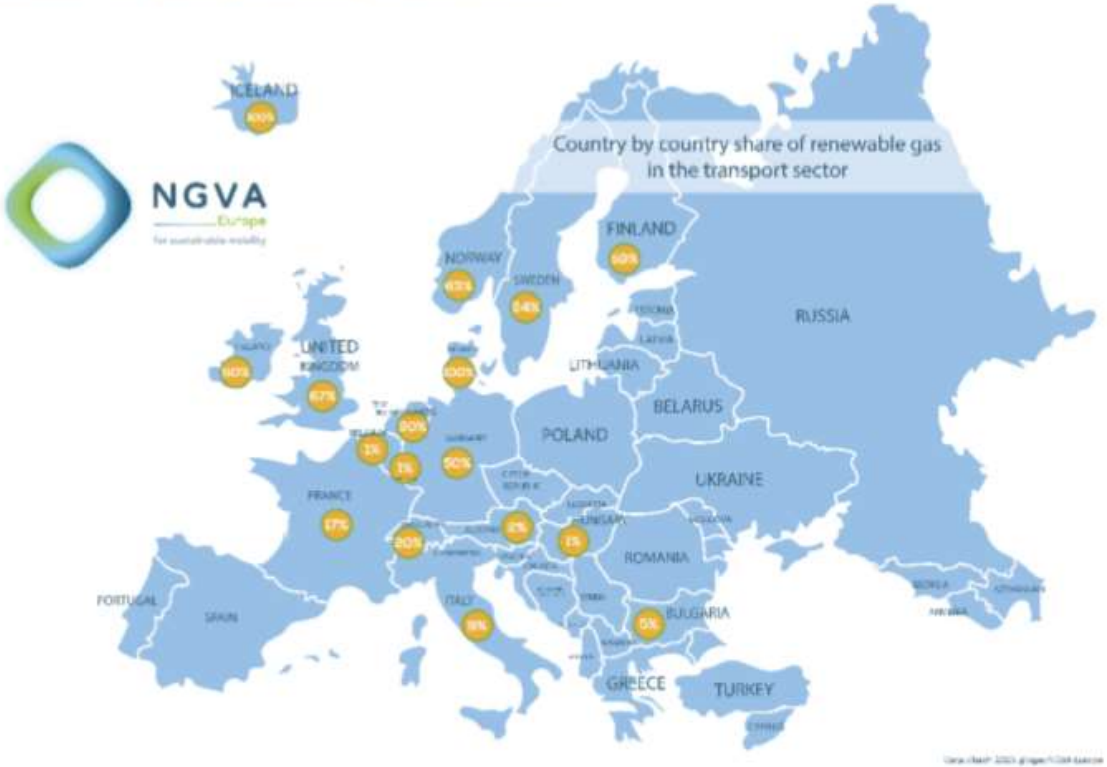
Reality	Potencial Biogás (Nm^3/h)	Potencial Biometano (Nm^3/h)	Potencial Energético anual (GWh)	Potencial Energético anual (bcm)	Turismos Equiv.	Viviendas Equiv.	Emisiones Equiv. GN ($tonCO_2$)	Emisiones Equiv. Diésel ($tonCO_2$)
TOTAL	16.839,5	8.799	767,7	0,0656	56.447	109.668	154.487	204.002

Only 1 Biomethane facility

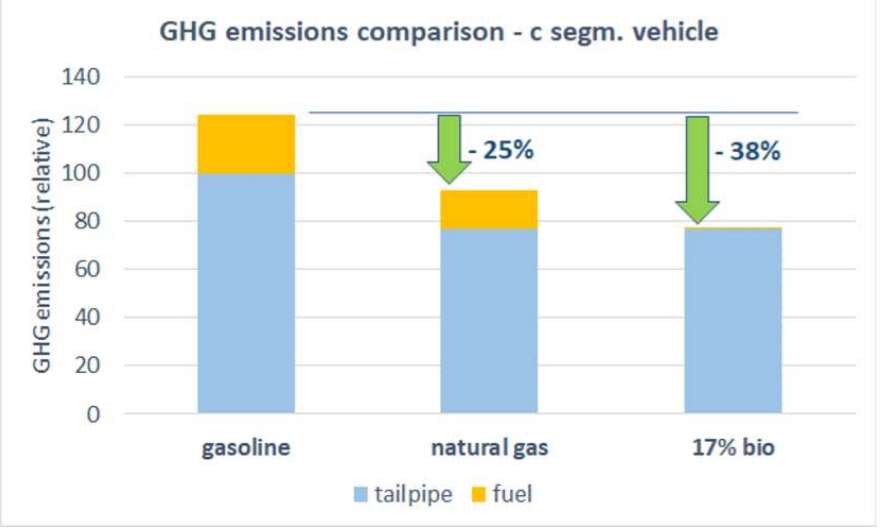
Spanish situation

Only 1 Biomethane facility

Today, biomethane production is a reality, and already 17% of all gas consumed by the road transport sector in Europe is composed with it.



No applying in Spain



Future actions to increase the use of biogas

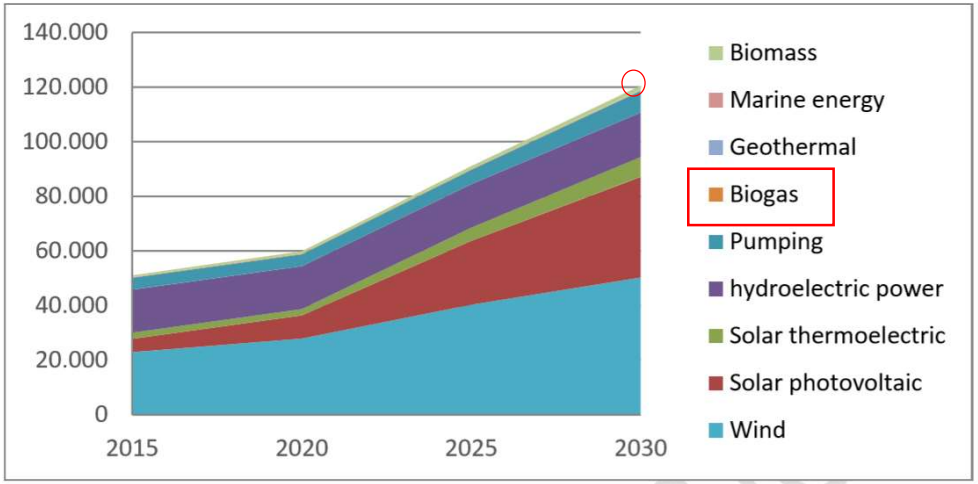
Future actions to increase the use of biogas

Ambitious Target Scenario 2030 Electricity system

Wind x 2 Biomass x 3

Solar x 4 **Biogas x 1.05**

Figure 3.1. Installed capacity of renewable technologies (GW)



Source: Ministry for Ecological Transition, 2019.

Table A.17. Electricity generation system in the Target scenario

Generation system in the Target Scenario (MW)				
Year	**2015**	**2020**	**2025**	**2030**
Wind	22 925	27 968	40 258	50 258
Solar photovoltaic	4 854	8 409	23 404	36 882
Solar thermoelectric	2 300	2 303	4 803	7 303
Hydroelectric power	14 104	14 109	14 359	14 609
Mixed Pumping	2 687	2 687	2 687	2 687
Pure Pumping	3 337	3 337	4 212	6 837
Biogas	223	235	235	235
Geothermal	0	0	15	30
Marine energy	0	0	25	50
Biomass	677	877	1 077	1 677
Coal	11 311	10 524	4 532	0-1 300
Combined cycle	27 531	27 146	27 146	27 146
Coal cogeneration	44	44	0	0
Gas cogeneration	4 055	4 001	3 373	3 000
Petroleum products cogeneration	585	570	400	230
Fuel/Gas	2 790	2 790	2 441	2 093
Renewables cogeneration	535	491	491	491
Cogeneration with waste	30	28	28	24
Municipal solid waste	234	234	234	234
Nuclear	7 399	7 399	7 399	3 181
Total	105 621	113 151	137 117	156 965

Source: Ministry for Ecological Transition, 2019

So, new biogas facilities are not for electricity generation

Future actions to increase the use of biogas

Measure 1.4. Support for the industrial sector

a) Description

The introduction of renewable energies into industry is an unavoidable challenge if we want to progress towards the systemic decarbonisation of the economy.

The possibility of introducing electricity self-consumption into the industrial sector, although barely happening currently, is an interesting future prospect. Issues relating to self-consumption are analysed in greater detail in other sections of this document.

As regards thermal uses in industry, it should be taken into account that according to the report 'Energy in Spain 2016' published by the MITECO, **final energy demand in the industrial sector was around 24 % in Spain in 2015. Renewable energy sources** covered barely 7 % of this demand (primarily biomass). There is significant potential for biomass, as well as other renewable energy sources (particularly, biogas and solar thermal energy) to contribute more heavily to the decarbonisation of the industrial sector.

Thermal uses

When designing the mechanisms, both increasing the penetration of renewables into subsectors that already consume them and diversifying the industrial subsectors will be assessed, given that there is currently a concentration of renewable energy consumption in four very specific subsectors (cement production, pulp and paper production, drinks and tobacco, and timber and timber products), with practically no consumption of renewable energies in the rest.

Future actions to increase the use of biogas

IMPORTANT **Measure 1.7. Promotion of renewable gases**

a) Description

To date the promotion of renewable gases has been limited mainly to biogas. The particular characteristics of biogas make it one of the few renewable energy vectors that can be used both to generate electricity and to cover energy demand in the thermal sectors.

Furthermore, in terms of reducing greenhouse gas emissions, it achieves not only the reduction derived from using a 100 % renewable fuel, but also an additional reduction in non-ETS emissions (mainly, CH_4), linked to better management of municipal waste, sewage sludge and farm waste.

The measures implemented to date for remunerating electricity generation at biogas plants have not had the results expected, with biogas use in Spain far below the existing potential and far from that achieved in other European countries.

In recent years, the purification of biogas into biomethane has gained importance as, once certain quality requirements are met, the biomethane can be injected into natural gas networks.[37]

Pipe injection

With regard to thermal uses, biomethane is of particular interest as regards decarbonising this type of energy demand, primarily in the industrial sector, which, given its characteristics (for example, high temperature, demand for steam), is difficult to meet with other renewables.

Finally, the reduction in the cost of electricity produced using renewables, and of hydrogen electrolysis and energy recovery technologies, hints at the potential of other renewable gases in the medium and long term.

Future actions to increase the use of biogas

c) Mecanismos de actuación

El impulso de la utilización del gas renovable se centra en la superación de las principales barreras tanto técnicas como administrativas a las que debe hacer frente. Tales barreras son, entre otras:

- Elevado coste de producción a partir de fuentes renovables, muy superior a la extracción y procesamiento de los combustibles fósiles o a la producción de gas descarbonizado (o de bajo contenido en carbono) a partir de materias primas de origen fósil.
- Inexistencia de un certificado de origen reconocido que garantice su origen renovable y valorice su consumo.
- Necesidad de establecer con claridad los derechos, obligaciones y responsabilidades de los agentes involucrados en la producción, transporte y comercialización de gas renovable, dotándolos de la seguridad jurídica necesaria para emprender su actividad.
- Conveniencia de definir las condiciones para la inyección física (conexión) y la prestación del servicio de transporte y distribución del biometano (acceso).
- Desconocimiento por parte de los usuarios finales, especialmente en cuanto a la seguridad en su manejo y la validez de los equipos, siendo necesarias acciones de difusión, información y concienciación.
- Déficit de instalaciones de suministro. Por ejemplo, la instalación de hidrogeneras está sometida a un conjunto de procedimientos complejos para obtener los permisos requeridos, siendo reguladas como un conjunto de instalaciones independientes. Suponen elevadas inversiones y largos plazos de recuperación.

A la vista de las barreras anteriores, se fomentará, mediante la aprobación de planes específicos, la penetración del gas renovable, incluyendo el biometano, el hidrógeno 100% renovable y otros combustibles en cuya fabricación se hayan usado exclusivamente materias primas y energía, ambas de origen renovable, incluyendo acciones de I+D+i tanto para el biogás y el hidrógeno como para las tecnologías menos maduras como el *power to gas*.

Defining the Plan for knowing the potential in Spain

Para la realización de estos planes se analizará la situación de los gases renovables en España, teniendo en cuenta los diferentes grados de madurez tecnológica de las distintas opciones, lo que incluirá:

- Determinación y proyección del potencial de producción teórico a 2030/2050. Justificación de la demanda asociada, técnicamente viable y económicamente rentable en comparación con otras opciones de descarbonización, considerando beneficios por flexibilidad del sistema (binomio electricidad-gas), así como el potencial de utilización y aprovechamiento de la red existente de gas natural.
- Definición de una estrategia para determinar el uso más eficiente y la manera más eficaz de aprovechar este recurso.
- Diseño de los mecanismos de apoyo, basados en objetivos de penetración, que permitan el aprovechamiento eficiente del gas renovable, sustentados en un sistema de certificación que permita la supervisión y control de los objetivos, así como mecanismos de flexibilidad que favorezcan la máxima eficiencia en el logro de los objetivos en competencia con otras opciones de descarbonización.
- Desarrollo de regulaciones que permitan la inyección de dichos gases renovables en la red de gas natural.
- Determinación de un sistema de garantías de origen de los gases renovables que acredite la procedencia y trazabilidad de los mismos y el impacto ambiental asociado a su producción y uso.
- Identificación y eliminación de las barreras regulatorias que dificulten el desarrollo de los gases renovables, especialmente del *power to gas*.

Future actions to increase the use of biogas

Measure 1.15. Reduction of greenhouse gas emissions in the waste management sector

a) Description

a.1. Domestic or community composting

This essentially concerns recycling bio-waste or the organic fraction of urban waste *in situ*, by means of domestic or community composting. This measure is aimed at families, schools or neighbourhood associations in rural, semi-urban and urban areas.

The implementation of the measure will involve distributing composters among the target population, as well as an awareness-raising/training campaign for the households and communities involved to ensure the measure's success. As a result, it will be possible to avoid sending bio-waste to landfill, to reduce the collection frequency for the remaining fraction and to obtain high-quality compost.

a.2. Separate collection of bio-waste for composting

The target population of this measure is mainly semi-urban areas and certain urban areas. The universe for this measure is the total amount of organic material and vegetable waste produced by the population, both domestic and major producers, that is taken to landfill.

Implementing it will require a new strategy for the collection model, the upgrading of the fleet where applicable and the construction or redevelopment of composting plants depending on the population concerned. The reductions will be the result of redirecting bio-waste destined for landfill and reducing collection frequency.

a.3. Separate collection of bio-waste for biomethanation

This measure concerns the implementation of a separate bio-waste collection system, but in this case it will be taken to a biomethanation plant, for use as a biofuel. The target population is primarily urban, since plants with a capacity over 40 000 tonnes are being considered.

In this case the mitigation effect has two aspects, one in line with the previous points made in relation to the collection frequency and avoiding landfilling bio-waste, and another that concerns the saving achieved by using a renewable energy.

a.4. Reduction of food waste

Future actions to increase the use of biogas

Measure 1.6. Advanced biofuels in transport

a) Description

Transport contributes heavily to greenhouse gas emissions (**27 % of the total in 2016**). Consequently, it is a key sector in the decarbonisation process.

Road and rail transport represent almost **one third of total energy consumption**, representing 28 241 ktoe in 2016 (28 368 ktoe according to the methodology established in the Renewable Energy Directive). This year the contribution of renewable energies in this sector reached **5.3 %** (calculated pursuant to the aforementioned methodology).

The revision of the Renewable Energy Directive establishes an overall objective for renewables in transport of **14 % by 2030**. Furthermore, specific objectives for advanced biofuels have been set for 2022 (0.2 %), 2025 (1 %) and 2030 (3.5 %). This overall objective for renewable energies and, consequently, the decarbonisation of transport will be achieved by reducing consumption (for example, by promoting a modal shift) and with the contribution of different technologies (primarily biofuels and renewable electricity).

The measures relating to both the modal shift, particularly in the sphere of urban and metropolitan mobility, and the electrification of transport, understood in terms of the vehicle fleet and recharging infrastructure, are explained in more detail in the Energy Efficiency section of this Plan.

Biofuels are currently the most widely available and widely used renewable technology in transport. Furthermore, in some sectors, such as heavy vehicles (whose consumption is a significant share of the total for road transport) and aviation, they will continue to be the only way to reduce the use of fossil fuels over the coming years. In order to achieve the advanced biofuel consumption objectives, advanced biofuel production must be boosted, as it is still very low. This is due, in some cases, to the limited availability of some of the raw materials required and, in others, to the lack of technological maturity of some of the manufacturing processes involved in producing this type of biofuel.

b) Objectives addressed

Penetration of renewable energy sources and displacement of fossil fuels, and innovation.

c) Mechanisms for the introduction of biofuels

The following mechanisms are planned in this regard:

- general obligation to sell or consume biofuels;
- adaptation of the certification system to specifically cover advanced biofuels and, in particular, biomethane injected into the network;
- ~~aid programme for advanced biofuel production facilities;~~
- establishing a specific obligation to sell or consume advanced biofuels for the 2021-2030 period;
- ~~promotion of the consumption of labelled blends of biofuels, through measures that enable~~ this option to be offered at service stations, and reduced rates on fuel excise duty to be applied;
- establishing specific consumption objectives for biofuels in aviation.

d) Responsible bodies

MITECO, Ministry of Science, Innovation and Universities.

Future actions to increase the use of biogas

Offical and public query from the Governement to define the biogas Roadmap

VICEPRESIDENCIA
CUARTA DEL GOBIERNO DE ESPAÑA

MINISTERIO
PARA LA TRANSICIÓN ECOLÓGICA
Y EL RETO DEMOGRÁFICO

#ESTE VIRUS LO PARAMOS UNIDOS

Información disponible en energia.gob.es

El MITECO abre los procesos de consulta pública previa de las Hojas de Ruta de Biogás y para el desarrollo de la Eólica Marina y las Energías del Mar en España

- **La elaboración de ambos documentos contribuye al cumplimiento del Plan Nacional Integrado de Energía y Clima (PNIEC) 2021-2030 y está en consonancia con la ruta marcada en el anteproyecto de la Ley de Cambio Climático y Transición Energética**

- **El plazo para recibir aportaciones finalizará 15 días después de la conclusión el actual estado de alarma**

29 de abril 2020.- El Ministerio para la Transición Ecológica y Reto Demográfico (MITECO) ha abierto hoy, miércoles 29 de abril, dos procesos de consulta pública previa para la Hoja de Ruta del Biogás y la del desarrollo de la Eólica Marina ("off-shore", en su denominación inglesa) y las Energías del Mar en España, esta última a través del Instituto para la Diversificación y el Ahorro de la Energía (IDAE).

de prensa

Future actions to increase the use of biogas

Parlament discussion of the Spanish climate change plan today

ANTEPROYECTO DE LEY DE CAMBIO CLIMÁTICO Y TRANSICIÓN ENERGÉTICA

14-05-2020

El Gobierno aprobará mañana la Ley de Cambio Climático

Por **Europa Press** - 18 de mayo de 2020

LO MÁS LEÍDO

Future actions to increase the use of biogas

Approval of the Spanish climate change plan today

Movilidad sin emisiones y transporte

Artículo 12. *Promoción de movilidad sin emisiones.*

3. Los municipios de más de 50.000 habitantes y los territorios insulares introducirán en la planificación de ordenación urbana medidas de mitigación que permitan reducir las emisiones derivadas de la movilidad incluyendo, al menos:

a) El establecimiento de zonas de bajas emisiones no más tarde de 2023.

b) Medidas para facilitar los desplazamientos a pie, en bicicleta u otros medios de transporte activo, asociándolos con hábitos de vida saludables.

c) Medidas para la mejora y uso de la red de transporte público.

d) Medidas para la electrificación de la red de transporte público y otros combustibles sin emisiones de gases de efecto invernadero, como el biometano.

Artículo 10. *Fomento y objetivos de los gases renovables.*

1. El Gobierno fomentará, mediante la aprobación de planes específicos, la penetración de los gases renovables, incluyendo el biogás, el biometano, el hidrógeno y otros combustibles en cuya fabricación se hayan usado exclusivamente materias primas y energía de origen renovable o permitan la reutilización de residuos orgánicos o subproductos de origen animal o vegetal.

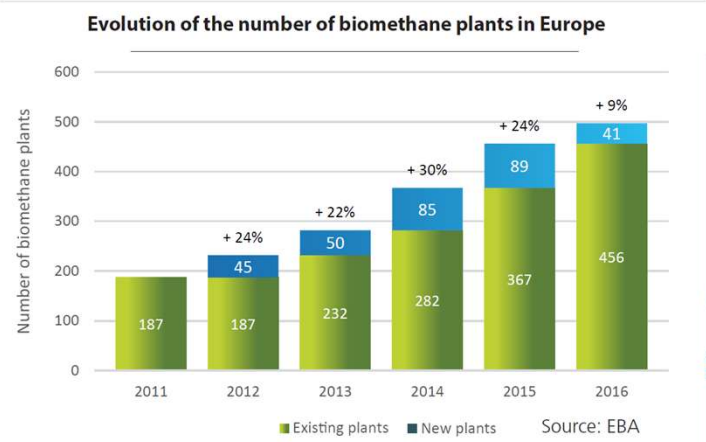
2. Para el cumplimiento de los objetivos establecidos en los Planes Nacionales Integrados de Energía y Clima, los planes de fomento del apartado anterior podrán prever, entre otras, las siguientes medidas, que serán aprobadas por el Gobierno:

a) Objetivos anuales de penetración de los gases renovables en la venta o consumo de gas natural, indicando los tipos de producto con que se deberá cumplir la obligación y los sujetos obligados.

b) Un sistema de certificación que permita la supervisión y control de las obligaciones así como mecanismos de flexibilidad que favorezcan la máxima eficiencia en el logro de los objetivos.

c) Regulaciones que favorezcan la inyección de dichos gases renovables en la red de gas natural.

Conclusions



All to do:

Only 1 biowaste facility injecting biomethane into the pipe, comparing with more than 500 in Europe

Conclusions

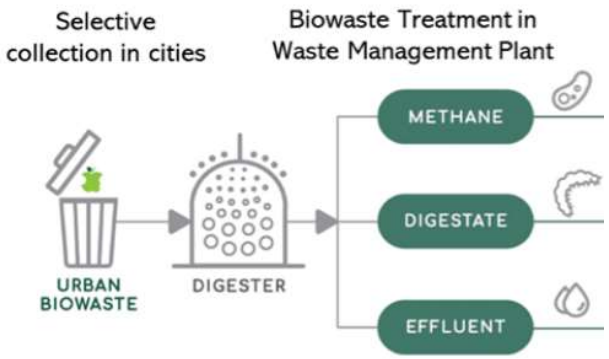
Everywhere:

Big projects

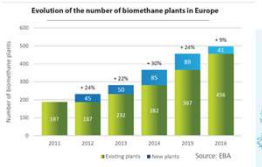
and

small scale projects

VALUEWASTE



Conclusions



- Spain is bad positioned in Europe,

- Having and ambitious Plan,

- but we need laws and incentives to grow biogas production.

THANKS

Javier Cervera Alonso
jcervera@geniaglobal.com

WORLD BIOGAS ASSOCIATION

GENIA GLOBAL ENERGY
Avda Ronda Nazaret, 9
Valencia (Spain)
www.geniaglobal.com
Tel. (+34) 963 636 147