

A decorative graphic on the left side of the slide, consisting of a complex network of thin, light teal lines forming a series of interconnected triangles and polygons, resembling a wireframe or a molecular structure.

EU CASE STUDY / DENMARK BEST PRACTICE & INNOVATIVE APPROACH TO BIOMETHANE

Forum on Ukraine Renewable Gases

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AGENDA



100 % GREEN GAS



BIOMETHANE IN DENMARK



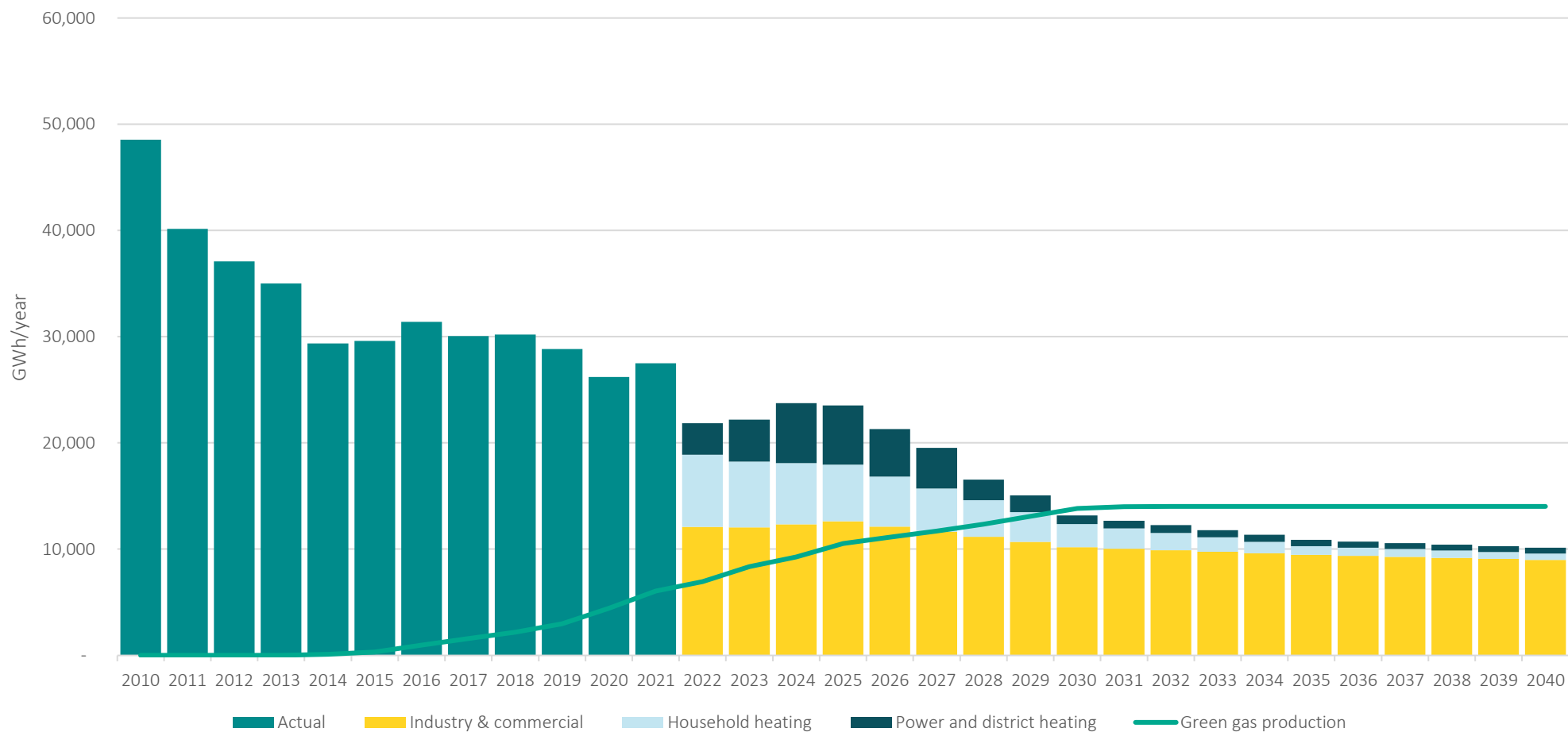
KEY DRIVERS



INTERNATIONAL COLLABORATION



100 % GREEN GAS BY 2030 – OR EARLIER



BIOMETHANE IN DENMARK

The production of biogas will help us achieve our goal of being **CO2-neutral** in 2045.

Biogas helps to **ensure security of supply**, as this can make us independent from Russian gas.

The production of biogas with residual and waste products is green energy, in contrast to the natural gas that we have until recently imported on a large scale from Russia to Europe.



Considering
byproducts from
the agricultural
sector as a
resource

Subsidizing
biomethane to
ramp up
production

Cost-sharing
framework to
maximize
injection

Accepting a
higher level of
oxygen content

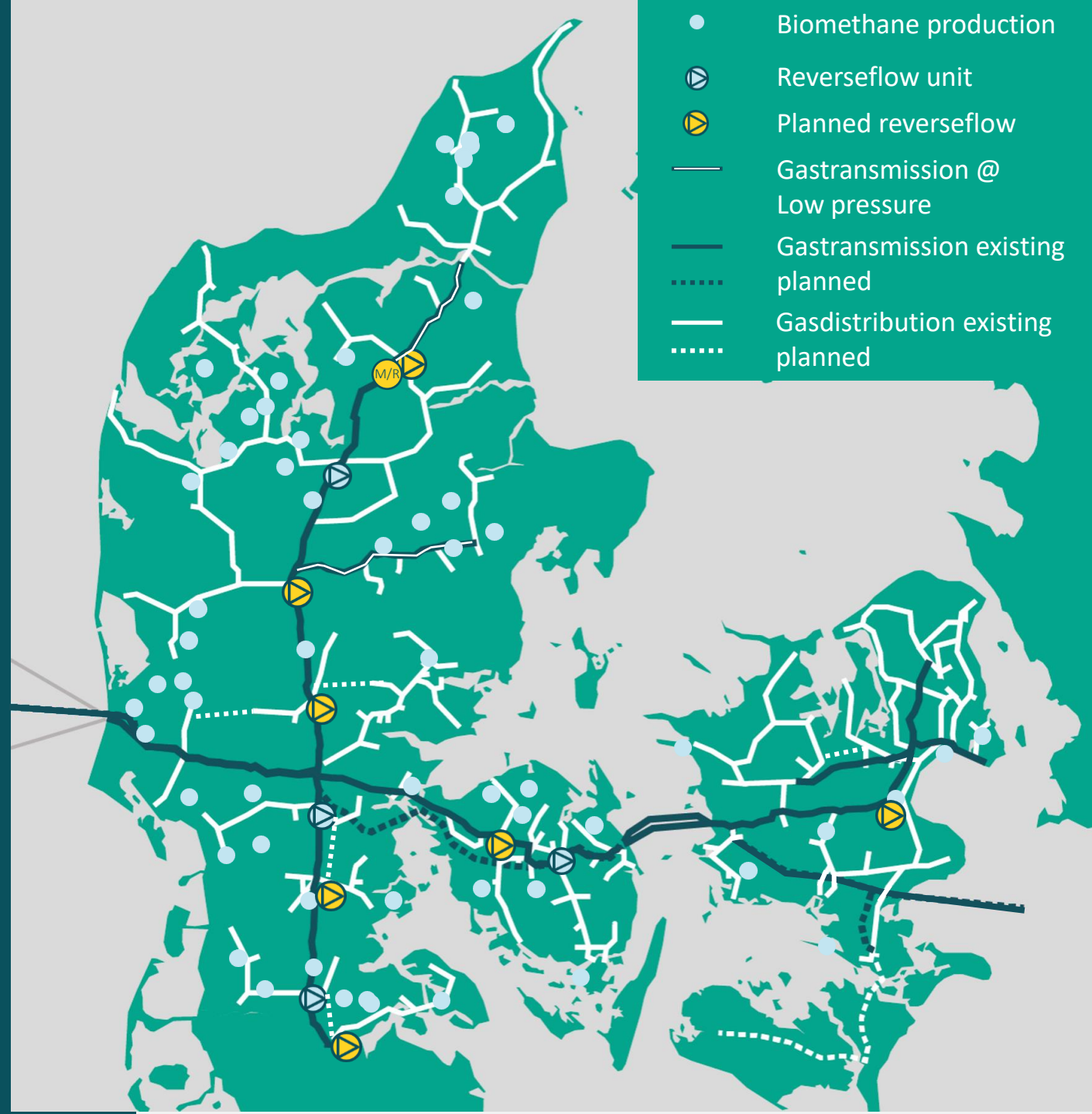
Documenting
the green value
of biomethane

Consumers/
Industry take
the lead

HIGHER SHARE OF BIOMETHANE

In the future, we can handle biomethane production in almost any part of our system.

Would we have made the same decisions if we knew this development ahead?



THE DANISH BIOMETHANE DEVELOPMENT – 5 STEPS

ENERGINET

STEP 1 "LOCAL"

ENERGINET

STEP 2 "UPGRADED"

ENERGINET

STEP 3 "TRANSMISSION"

ENERGINET

STEP 4 "INTERCONNECTED"

ENERGINET

STEP 5 "CONTINENTAL" (NEXT STEP / 5)

ENERGINET

THE DANISH BIOMETHANE DEVELOPMENT – 5 STEPS

The Danish biomethane development can be divided into 5 steps, based on milestones in the gas infrastructure development, which have enabled the production of biomethane over increasing, larger and contiguous areas. Step 1 "Local", Step 2 "Upgraded", Step 3 "Transmission", Step 4 "Interconnected" and Step 5 "Continental".

Below you will find a condensed description of the actions taken and developments made for each step, structured according to 6 parameters, which have been essential for the Danish biomethane development: Infrastructure, market, green value, regulation, subsidy scheme and operating economy.

We have not yet taken all 5 steps in Denmark. Currently, we are on step 4 where further action is needed before progressing to the next step. It means that the actions and developments described in step 5, which we have not yet been through, are not actual experiences but rather potentials for further development, which can contribute to achieving 100% biomethane coverage.

STEP 1 "LOCAL"

- Direct connection between production and consumption at a very small scale.
- Substituting use of biogas in CH4 generation.
- Waste water and residue resource from large agricultural sector used as feedstock. Considered a resource and top waste.

STEP 2 "UPGRADED"

- Upgrading plants connected to distribution network to biogas. It is upgraded to biomethane.
- Establishment of a national certificate regime.
- Right to inject policy.
- Substitution of uses of biogas.
- Transparent accounting.
- Transport maximising operation.

STEP 3 "TRANSMISSION"

- Reverse flow from C&O to T&O network.
- Cut-off date for existing subsidy scheme.
- Coherence with "turnaround" regulation.
- Need for flexible feedstock sources.
- Demand-pull incentives and sustainability schemes enables use of feedstock regulation + e.g. ETS and biogas quota.

STEP 4 "INTERCONNECTED"

- Cross-border flows of biomethane.
- Improving the quality standard for cross-border gas flows to allow for whitelisted cross-border flow of biomethane.
- National green value exchange.
- Subsidy green value through technology neutral system.
- Balance agreements on cross border trade of certificates.

STEP 5 "CONTINENTAL" (FUTURE VISION)

- Connection between regional transmission networks via transmission pipelines and LNG shipping.
- Continental CO2 storage and scheme.
- Continental green value exchange.
- During the green value exchange the gas is used.
- Substituting biomethane is not longer necessary in certain countries.
- Large quantity of land area and large production on the agricultural sector.

Link to Energinet's full presentation on "Danish Biomethane Experiences": <https://en.energinet.dk/Gas/Biomethane/Danish-Biomethane-Experience>

ENERGINET GLOBAL BIOMETHANE ACTIVITIES





COLLABORATION IN EUROPE

- How to deliver 35 bcm biomethane
- Collaboration across nations
- Transforming the biomethane market from a local market to a national and European level
- Identifying obstacles and possible solutions
- New discussion paper on the role of biomethane in the future energy system
- Better understanding of end users





THANK YOU FOR YOUR
ATTENTION

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