POSITION PAPER

RENEWABLES FOR HEATING AND COOLING AND EU SECURITY OF SUPPLY:
SAVE OVER 20 BILLION EURO ANNUALLY IN REDUCED FOSSIL FUEL IMPORTS

21st May 2014

KEY MESSAGES

THE CURRENT SECURITY OF SUPPLY EMERGENCY IS MAINLY A HEATING CRISIS: The renewed concerns for our security of supply are mainly due to the EU's heavy dependency on natural gas from Russia. Indeed, **natural gas is mainly being used** in the following sectors: **41% for heating of buildings**, **31% for industrial processes**, and only to a lesser extent in power plants (~25%).

RENEWABLES FOR HEATING AND COOLING MUST BE A PILLAR OF THE EU'S ENERGY SECURITY STRATEGY: Small and large-scale geothermal, biomass, and solar thermal technologies are **fast, versatile and practical options which, alongside energy efficiency, will alleviate our fossil fuels dependency by quickly replacing natural gas** in the residential and tertiary sectors as well as for industrial processes. As fossil fuels and electricity prices are set to further increase in the next years, renewables for heating and cooling (RHC) are preferable to volatile and costly alternatives, including direct electric heating and should be acknowledged as such.

SAVING THE EU UP TO €21.2 BILLION ANNUALLY IN AVOIDED GAS IMPORTS: **By achieving the targets for renewables in heating and cooling** (21.4 % in 2020), the EU could reduce its gas imports by the equivalent of 28.7 Mtoe annually in 2020. With current average import prices, **this would save the EU some € 9.6 bn**. However, **with more ambitious policies**, it would be possible to cover **25%** of the total heat demand by the end of this decade. The annual **savings in reduced fossil fuel imports would amount to as much as € 21.8 bn compared to 2012.**

PROPOSAL FOR A 2030 CLIMATE AND ENERGY FRAMEWORK - A MISSED OPPORTUNITY: Renewables for heating and cooling are vital to reduce energy dependency as well as to decarbonisation and competitiveness. However, **the Commission's 2030 proposal**, setting out a single GHG emissions reduction target of 40%, **would only imply an increase of renewables in heating and cooling from 21% in 2020 to some 25% in 2030. This is simply the equivalent of business-as-usual and needs to be urgently reconsidered.**

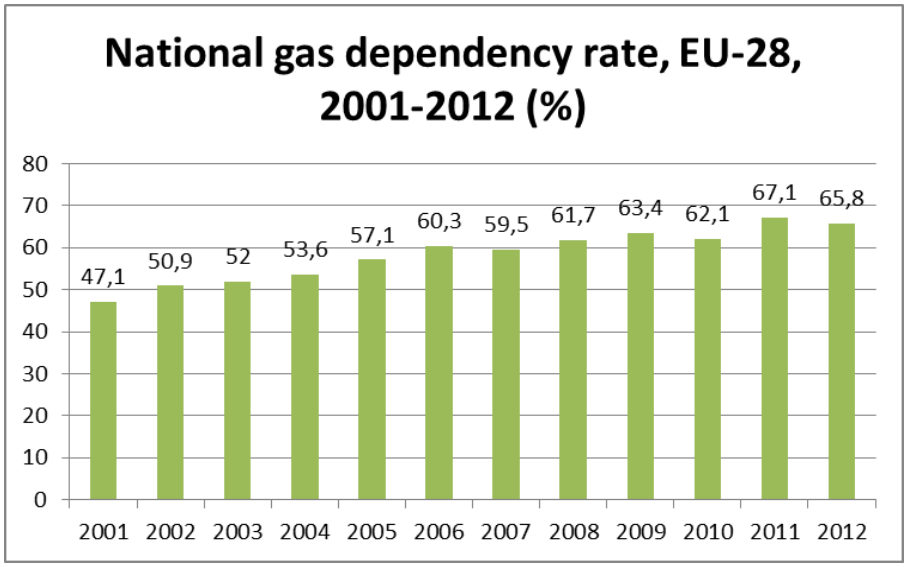
STABLE AND LONG-TERM FRAMEWORK CONDITIONS CALLED FOR: The industry is ready to deliver, but needs stable and long-term framework conditions. **Adequate and dedicated roots to activate current and future funds are needed**. In order to establish a level-playing field, it is of the utmost importance to i**mmediately phase-out fossil fuels subsidies and to set a tax on carbon and other emissions in sectors not covered by the ETS (in particular in buildings)** .

AEBIOM, EGEC and ESTIF *represent the European Renewable Heating and Cooling industry associations of the biomass, geothermal and solar thermal sectors respectively.*

THE CURRENT EMERGENCY IS MAINLY A HEATING CRISIS

The growing uncertainties over the crisis in Ukraine show once again all the limits of Europe's energy dependency. According to Eurostat, about one third of the EU's total crude oil (34.5%) and natural gas (31.5%) imports in 2010 originated from Russia. The EU energy dependency contributed not only to weaken the EU geopolitical influence on the international arena but fuelled the dramatic GDP-leakage with the EU spending €545 billion or 4.2% of its GDP on importing fossil fuels in 2012 alone[1].

Security of energy supply was the main driver of the EU's energy policy in the mid-1990s in the move towards renewable energy. This concern has further increased over recent years as domestic conventional gas production in EU Member States, mainly originating from mature production basins, has decreased by 25% over the last decade. In the same period the overall EU gas consumption has increased by 10%[2]. As shown below, the result has been a **steadily increasing dependency rate for natural gas from 47.1% in 2001 to 65.8% in 2012**. **Without additional measures, imports will continue to rise dramatically.**



Source: EUROSTAT

A very significant part of this imported fuel is used for heating purposes. Indeed, **natural gas is mainly being used** in the following sectors: **41% for heating of buildings**, **31% for industrial processes**, and only to a lesser extent in power plants (25%)[3]. However, readily available renewable energy solutions, combined with energy efficiency measures, are a quick, practical and versatile option to alleviate fossil fuels dependency.

[1]European Commission, Directorate-General for Economic and Financial Affairs, "Energy Economic Developments in Europe", European Economy 1/2014, (2014a), p.112.
[2] European Commission, "Member States' Energy Dependence: An Indicator-Based Assessment", Occasional Papers 145, April 2013, p. 14.
[3] Eurogas Statistical Report 2013, p.5.

RENEWABLES FOR HEATING AND COOLING MUST BE A PILLAR OF THE EU'S ENERGY SECURITY STRATEGY

According to European Commission's analysis, the price of electricity and fossil fuels has been rising over the last years and is set to increase dramatically in the next decades. RHC technologies are **fast, versatile and practical options to alleviate our fossil fuel dependency.** They can provide more stable and affordable options to European households and industry than volatile, costly and inefficient alternatives, including direct electric heaters.

Renewable heating and cooling technologies can replace gas in the residential and tertiary sectors (low temperature up to 95° C) and for industrial processes, e.g. washing, rinsing, and food preparation (medium temperature between 95° C and 250° C). Additionally, biomass can provide heat above 250°, and further R&D will enable solar thermal collectors and deep geothermal technology to cover high temperature heat demand for industry, which is the only segment where electricity is still needed.

Biomass, geothermal and solar thermal are renewable energy sources that can be harnessed and distributed through district heating (biomass, deep geothermal and, increasingly, solar thermal), boilers (biomass), collectors (solar), heat pumps (shallow geothermal).

Some examples of how these renewable energy sources can quickly replace gas in district heating systems in Central and Eastern Europe are provided below.

Replacing natural gas with deep geothermal in district heating systems

Where: Miskolc, Hungary **What**: District heating plant operated by Pannergy – 55 MWth

Objective: To replace natural gas consumption of and hazardous material emissions from the city's central heating plant with renewable energy, which would ultimately ensure a cleaner and more liveable city for the inhabitants of Miskolc.

Key data: The thermal water reserve in the Mályi Well lay at a depth of approx. 2300 meters, and the resurgent water served as an excellent basis for drilling operations in terms of both yield (150 l/s) and temperature (105°C). The heat output of the thermal wells is transmitted to the heat consumers via pipelines and heat exchangers, while after cooling down the fluid is re-injected.

Project period: 2010 – 2013; Total investment cost is €25.000.000; Magnitude of the grant from EU ERDF and grant schemes funded from Hungary's central budget: €5.9bn; Total amount of GHG reduction approximately 150-200ton/year (estimation).

Replicability: Over 25% of the EU population lives in areas directly suitable for Geothermal District Heating in the EU. There is a large potential in Central and Eastern Europe, including Hungary (19 projects already in operation), Poland, Slovakia, Slovenia, the Czech Republic, and Romania, where existing heat networks are well developed.
More info: http://pannergy.com/en/projects/#miskolc

Conversion from gas to biomass in large district heating systems

Where: Jelgava, Latvia **What**: CHP plant operated by Fortum – 23 MWel / 45 MWth

Objective: From 2008 to 2013, turnaround from 100% gas (installations from 70s) to biomass (woodchips) and DH network renovation. In operation since September 2013.

Key data: To date, Jelgava biomass CHP plant provides up to 85% (226 GWh) of Jelgava district heating load. The total invested budget for the biomass plant was 76 Mln euros supported by funding from the EU cohesion Fund and the Investment and Development Agency of Latvia). This investment has led to a reduction of about 20% of the heat energy tariffs and about 95% of CO2 emissions.

Replicability: This project was the first and largest project of such kind in Latvia. There are many other cases of switching from fossil fuel to biomass. For example in Hungary (Pecs) or Czech Republic (Třebíč). Another future example is the city of Vilnius where the city Council has recently given its approval to proceed to the conversion of its DH system from gas to biomass.

Large Solar District Heating with seasonal storage

Where: Marstal, Denmark.

Objective: The aim of the project is to demonstrate that a large scale innovative, cost-effective and technically 100% sustainable renewable energy system can be used for District Heating. In Marstal 1,460 consumers now receive 55% of their thermal energy from solar production and 45% from other RES. The plant is part of the national strategy to develop large scale solar heating systems for District Heating and for seasonal heat storage, replacing previous DH systems which mainly used natural gas. It is among the largest solar DH systems in the world.

Collateral benefits: 2500 t CO_2 emissions avoided per year. Marstal selected as EU Flag Project.

KEY DATA: Installed capacity: 23 MW_{th} Reduction of final energy: 13 400 MWh/a. Replaced energy source: 1 200 000 m³ of natural gas[4], equivalent to 1.1 Mtoe. Solar collectors' area: 33.600 m^2.

REPLICABILITY: a careful feasibility study was carried out by the project, targeting sample countries across the whole of Europe. Results show that turning District Heating to 100% RES is replicable nearly everywhere in Europe.
More info: sunstore4.eu www.solarmarstal.dk

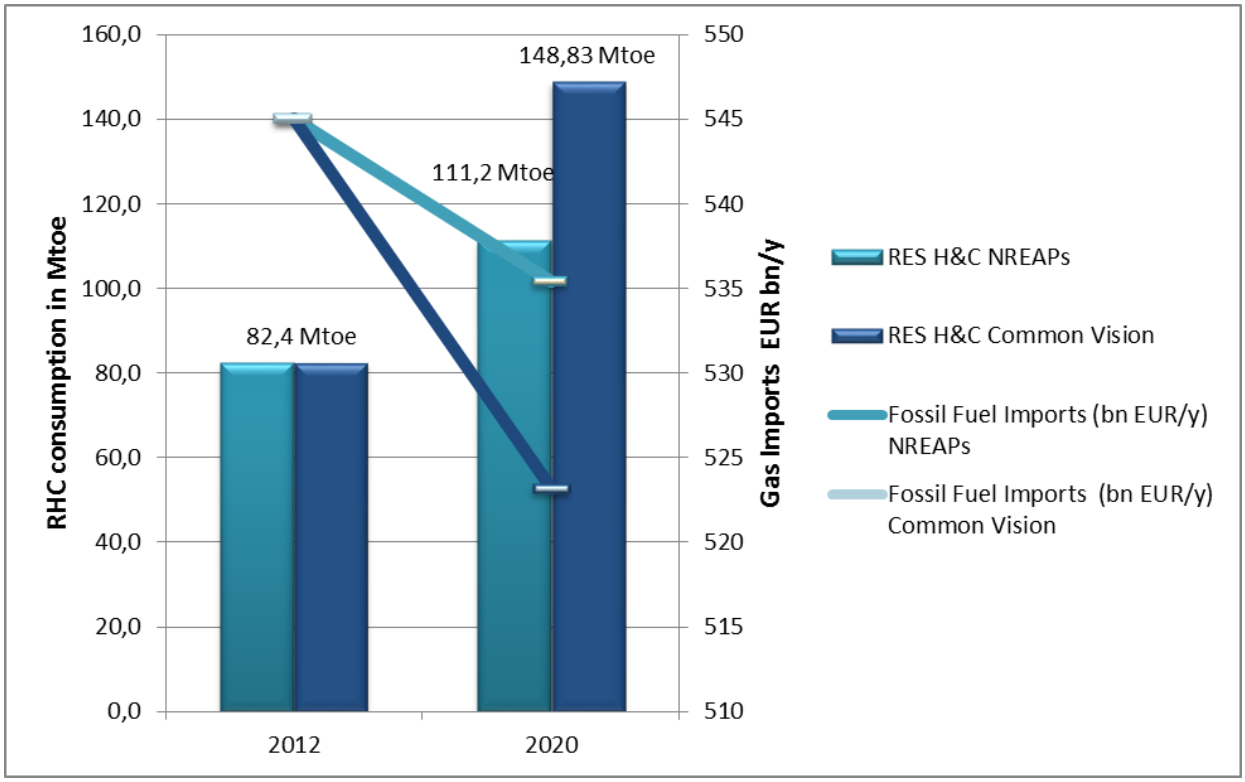
[4] Considering 90m^3 of gas used in average to produce 1MWh.

SAVING THE EU UP TO 21.2 ANNUALLY IN AVOIDED GAS IMPORTS

In 2012 the consumption of heating and cooling from renewable energy in the EU amounted to 82.4 Mtoe representing 15.6% of the total heat consumption[5]. According to the National Renewable Energy Action Plans (NREAPs), in 2020 renewables will make a total contribution of 111.2 Mtoe, or 21.4% of the total heat consumption projected for that year Assuming this additional renewable energy consumption substituted imported natural gas, the EU would reduce its fossil fuel imports from third countries by the equivalent of 28.7 Mtoe annually from 2020. With current average import prices ($11.5/ MMBtu or € 8.4/MMBtu)[6], this would save the EU some € 9.6 billion.

However, it is worth highlighting that with clear enabling policies it could be possible to generate 148 Mtoe from renewable heating and cooling technologies (RHC Common Vision Scenario[7]). By the end of this decade we could therefore produce some additional 65 Mtoe from RHC compared to 2012. By applying the same assumptions as above, the EU could save every year as much as € 21.8 billion in reduced fossil fuel imports compared to 2012.

The results of the NREAPs and RHC Common Vision scenarios are depicted in the figure below: The evidence is overwhelming: Renewables for heating and cooling, together with energy efficiency, stand out as a key factor to ensure security of energy supply, reducing foreign energy dependency.



[5] EUROSTAT, SHARES 2012.
[6] In January 2014; Source: World Bank.
[7] European Technology Platform on Renewable Heating and Cooling, Common Vision for the Renewable Heating and Cooling Sector in Europe: 2020-2030-2050.

PROPOSAL FOR A 2030 CLIMATE AND ENERGFY FRAMEWORK - A MISSED OPPORTUNITY

Renewables for heating and cooling are vital to reduce energy dependency as well as decarbonisation. However, **the Commission's 2030 proposal**, setting out a single GHG emissions reduction target of 40%, **would only imply an increase of renewables in heating and cooling from 21% in 2020 to some 25% in 2030.**

The table below illustrates the share of renewables in heating and cooling in the different scenarios explored by the Commission in its Impact Assessment[8] for the 2030 climate and energy proposal.

	Reference scenario	Current proposal, GHG 40	40% GHG/EE	GHG40/EE/RES30	GHG45/EE/RES35
Scenario description		*No targets and enabling policies for RES; the increased RES share mainly achieved in theETS sector*	*No targets and enabling policies for RES; the increased RES share mainly achieved in ETS sector, measures to speed up the buildings renovation rate*	*Pre-set 30% RES target and energy efficiency policies*	*Pre-set 35% RES target; measures to speed up the buildings renovation rate*
Renewables share in heating and cooling	23.8	25.9	25.8	30.6	35.2

The current proposal is simply the equivalent of business-as-usual and needs to be urgently reconsidered. Member States have the opportunity to require a further assessment and more ambitious and binding national targets.

STABLE AND LONG-TERM FRAMEWORK CONDITIONS CALLED FOR

Small and large scale renewable heating technologies can replace gas in the short-term to alleviate the current crisis, and in the long-term to prevent similar emergencies from happening again. The industry is ready to deliver, but needs stable and long-term framework conditions.

[8] European Commission, 2014, Impact Assessment accompanying the Communication "A policy framework for climate and energy in the period from 2020 up to 2030", SWD(2014) 16, p. 139.

For instance, given the decentralised nature of renewables for heating and cooling there is an urgent need for:

- **adequate and dedicated roots to activate the current and future available funds,** including EU Structural and Investment Funds and EIB loans.

- **the immediate phase-out fossil fuels subsidies and tax carbon and other emissions in buildings** and other non-ETS sectors. This is of the utmost importance to establish a level-playing field.

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