



Proceedings of FROnT High-Level Events

Work Package 5
- Proceedings of High Level Event

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ABOUT THE FRONT PROJECT

The FROnT project, co-funded by the European Union through the Intelligent Energy Europe programme, aims to develop strategies for a greater deployment of RES-HC technologies and improved understanding of the costs of heating and cooling technologies. It analyses both existing support schemes and end user decision factors, in order to help establishing strategic policy priorities for RES-HC.

The project is led by a consortium gathering European industry associations and national energy agencies from Spain, Portugal, The Netherlands, Poland, and UK assisted by the Austrian Institute of Technology, CREARA (consulting and energy management company), and Quercus (non-profit environmental organisation based in Portugal). More information available at <http://www.front-rhc.eu/>

INTRODUCTION

The project results and in particular the Strategic Policy Priorities should be presented in a High-Level Event (HLE) organized by WP5 leader. Due to the delay in the project and the very little cost linked to the organization of the HLE in the European Commission premises, the partners have agreed to organize two events allowing a better dissemination of the project results.

The first one has been organized in the framework of the 2016 *EU Sustainable Energy Week (EUSEW)* on 15 June 2016, in the premises of the European Commission (Charlemagne Building). The event has been endorsed by the European Commission and by the presidency of the Council – The Netherlands. This event was mainly political with high level representatives from Iceland, Lithuania and THE Netherlands. The objective was to focus on national Heating and Cooling (H&C) strategies and best practices in decarbonizing the H&C sector, as well as presenting FROnT policy recommendations to promote the deployment of renewable heating and cooling (RES-HC) solutions.

The second event has been organized in the framework of the *European Week of Regions and Cities* on 11 October 2016, followed by a networking cocktail. This event presented the online tool to compare cost of technologies (WP3) and the manual of good practices for support schemes (WP2). This event was more technical, with a panel debate including local authorities and industry representatives.

Both conferences have allowed to disseminate the findings of the project. It was also the occasion to receive comments and have good exchange of ideas on the subject.

EVENT 1: HOW TO MAKE THE EU NUMBER ONE IN RENEWABLE HEATING & COOLING

Date: 15 June 2016

Location: European Commission, Charlemagne Building, Room De Gasperi

Agenda:

Supported by



15.06.16



EU COMMISSION
CHARLEMAGNE BUILDING
ROOM 'DE GASPERI'



11.00 - 12.30

Welcome and Setting the Scene

Marie Donnelly, Director, DG ENER, Renewables, Research and Innovation, Energy Efficiency

Key Note Speeches: National Heating and Cooling Strategies – the Role of Renewables?

Ragnheiður Elín Árnadóttir, Minister, Ministry of Industry and Commerce of Iceland
Vidmantas Macevicius, Vice-Minister, Ministry of Energy of the Republic of Lithuania

The View of the Presidency of the Council of the EU

Tjalling de Vries, Program Manager Heat, Ministry of Economic Affairs of the Netherlands

What Policy Priorities to Become Number One in Renewable Heating and Cooling?

Gabriela Prata Dias, CEO, ADENE, Energy Agency, Portugal

Closing Session – the View of the European Parliament

Sean Kelly, Member of the European Parliament, EPP, Ireland

Networking lunch

**REGISTER
HERE**



Co-funded by the Intelligent Energy Europe Programme of the European Union
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Conference summary:

The conference has been recorded. The recording can be found at http://player.cdn.tv1.eu/player/macros/eutv/energyweek/150616_1100-1230

The event started with an **opening from the European Commission. Marie Donnelly, DG ENER Director of Renewables, Research and Innovation, Energy Efficiency** gave an opening speech setting the scene on the importance of the H&C sector (50% of total energy consumption). Ms Donnelly mentioned that putting the H&C sector at the centre of our policy actions is a key opportunity for the energy transition. She also emphasized on the different and various aspects of the H&C sector and the lack of information/data to understand and legislate this sector (ex: cooling). She admitted more work needs to be done in this sector and action needs to be taken now.



She mentioned that to deliver the objectives of the H&C Strategy published in February 2016, the European Commission is relying on three actions:

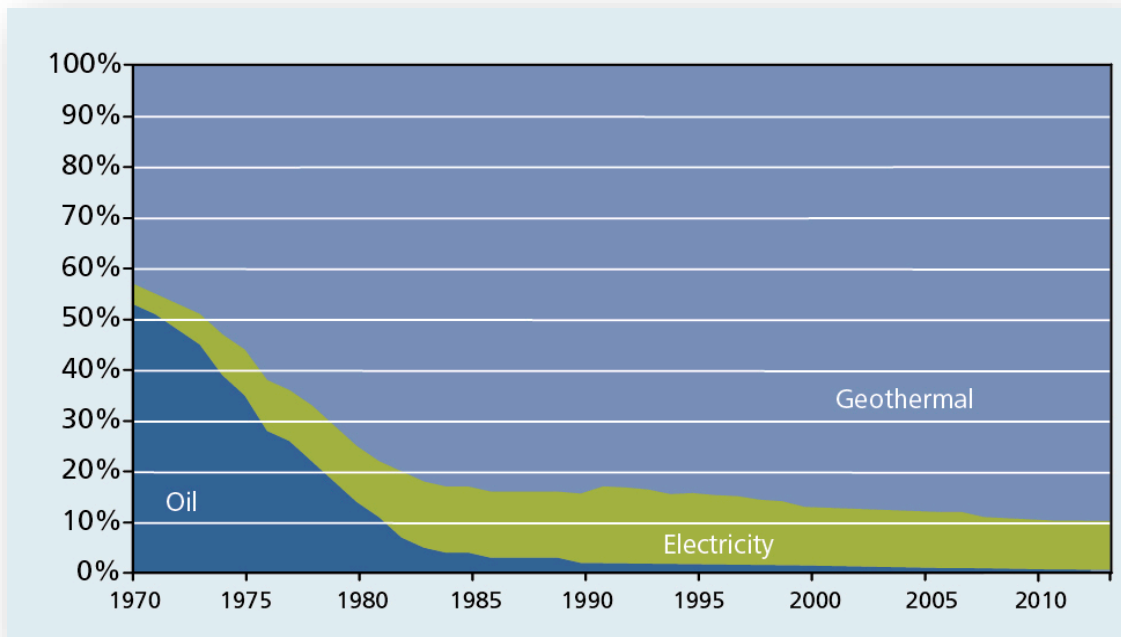
- The revision of legislations (the so-called Winter Package, published on 30 November 2016)
- Tackle the existing building stock, by starting now the replacement of old heating systems with the most efficient existing technologies (support linked to eco-design/eco-labeling)
- Mobilise funding and create awareness

She ended by hoping that these actions will allow the EU to reach its energy efficiency targets and grow RES share to at least (at least!) 27% of our total consumption.

The first key note speech has been given by Ms Ragnheiður Elín Árnadóttir, Minister of Industry and Commerce of Iceland. She started with a few facts on the H&C sector to show how important the H&C sector is to achieve its decarbonization objectives. She emphasized on the role of RES to reach our Climate and Energy objectives.

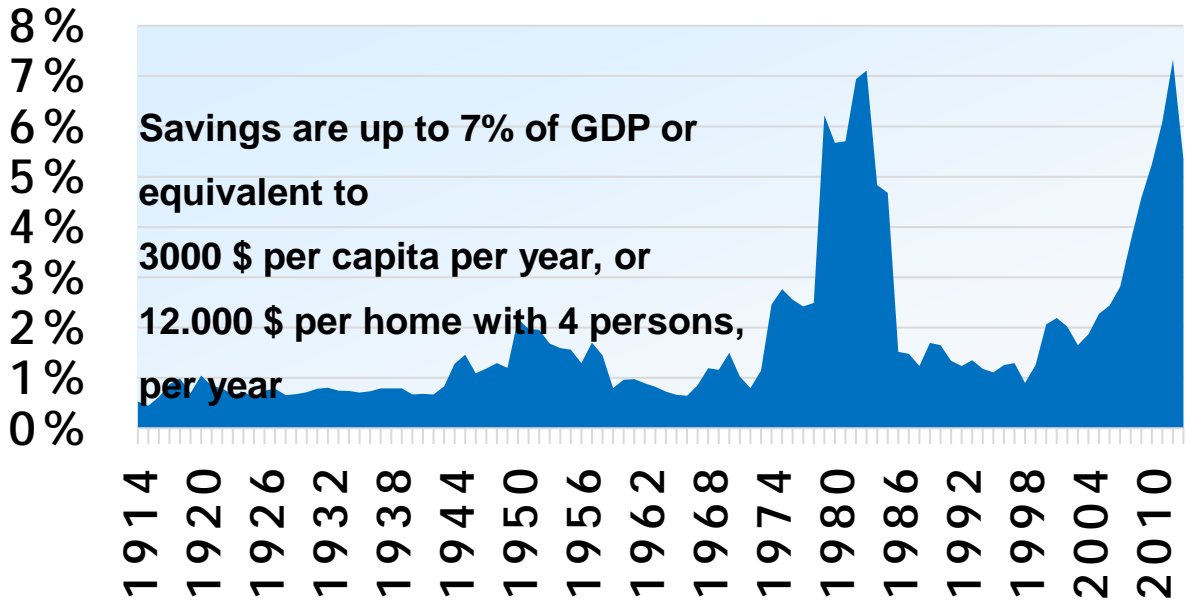
She reminds us that RES heating sources are mature and available but there is need for targets, market conditions and accompanying policy measures.

In this context, Iceland has a story to share in terms of secure sustainable and affordable heat supply to its citizens. 90% of heat and 25% of electricity is produced by geothermal energy.



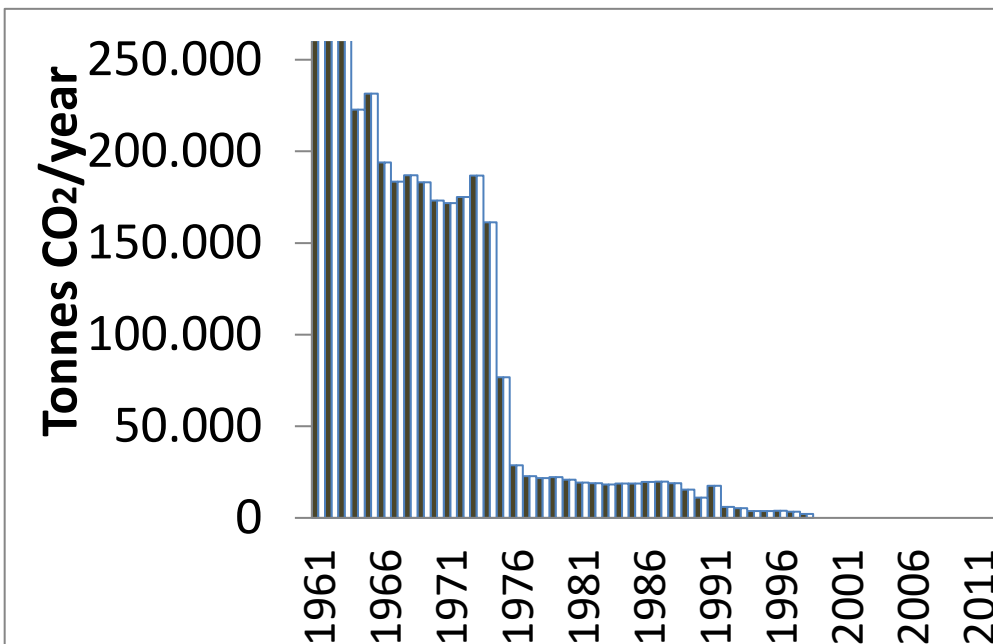
Concentrated efforts, long-term political vision, and necessary support mechanisms allowed Iceland to become a clean energy economy in just two decades.

It also makes economic sense to use RES. Savings amount to 7% of GDP or 300\$/per capita/year.



Source: Orkustofnun

The environmental benefits are also important, as it can be seen in below graph, with important CO2 reductions.



Geothermal energy can also be used for other uses: heat, electricity, agriculture, industry, melting snow, etc..

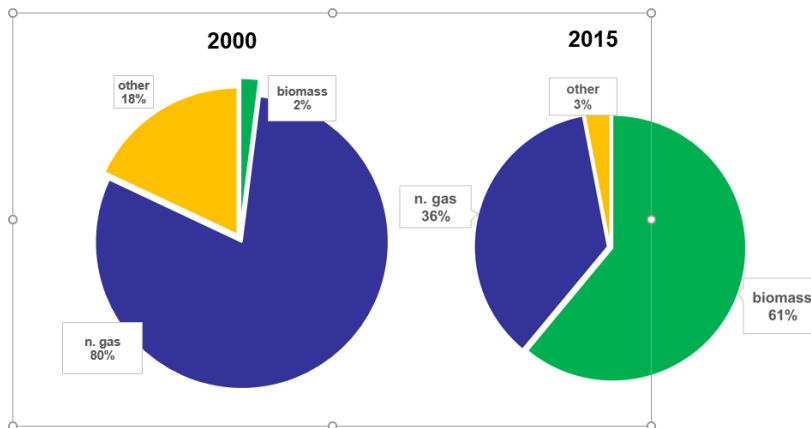
Economic, social and environment benefits are manifold. One of the main challenge however is financing and permitting. Policy can tackle these issues as the experience of Iceland can show. Using geothermal energy also creates jobs and innovation. This has become an important export product for Iceland. There is great potential to replace fossil fuels with geothermal in the EU.

Ms Ragnheiður Elín Árnadóttir concluded by summarizing the lessons learned from the Icelandic experience:

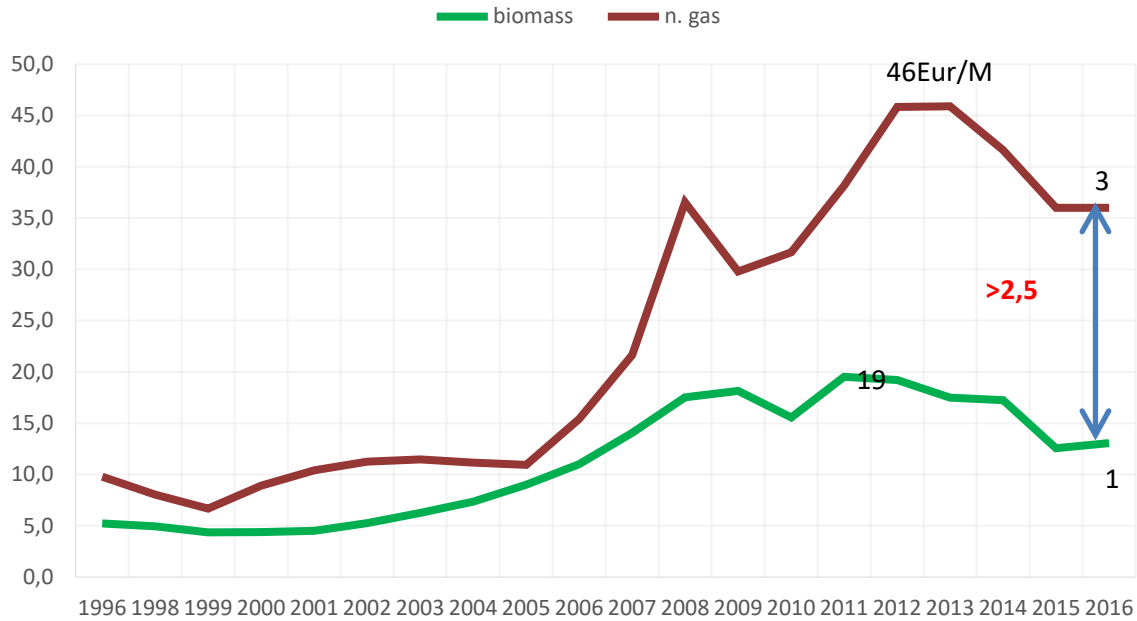
1. Harnessing a domestic natural resource
2. Economic opportunities and savings
3. Improve energy security
4. Reducing greenhouse gas emissions
5. Establish new industries and employment opportunities
6. Increase innovation and export of knowledge
7. Improving quality of life

The second key note speech has been given by Mr Vidmantas Macevicius, Vice-Minister of Energy of the Republic of Lithuania. He presented the situation in Lithuania where 55% of the heat supply is district heating. In 2000, it was mainly fueled by natural gas (80%) while in 2015, biomass was the main source of heat representing 61%.

THE STRUCTURE OF PRIMARY FUELS FOR DISTRICT HEAT PRODUCTION IN 2000-2015

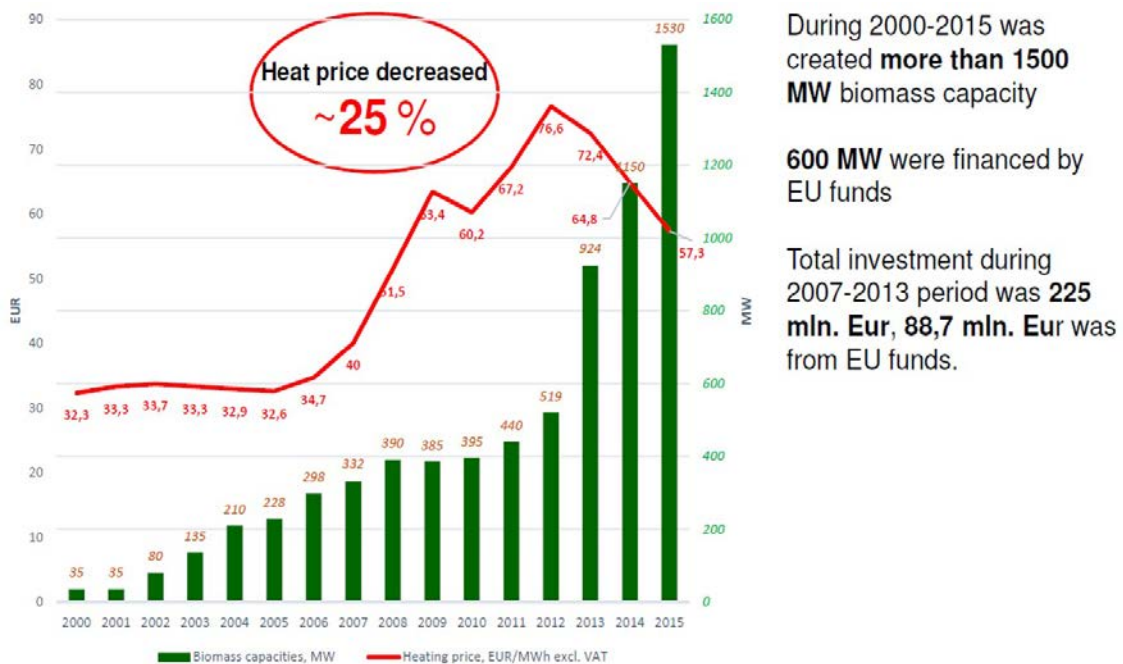


The main reason for the switch was the price of fuels, as it can be seen on below graph.



Half of biomass capacity installed in Lithuania was financed by EU funds because the investment cost of biomass installations is three times higher than natural gas. Support is therefore necessary.

The price of heat has then significantly decreased when more biomass is used.



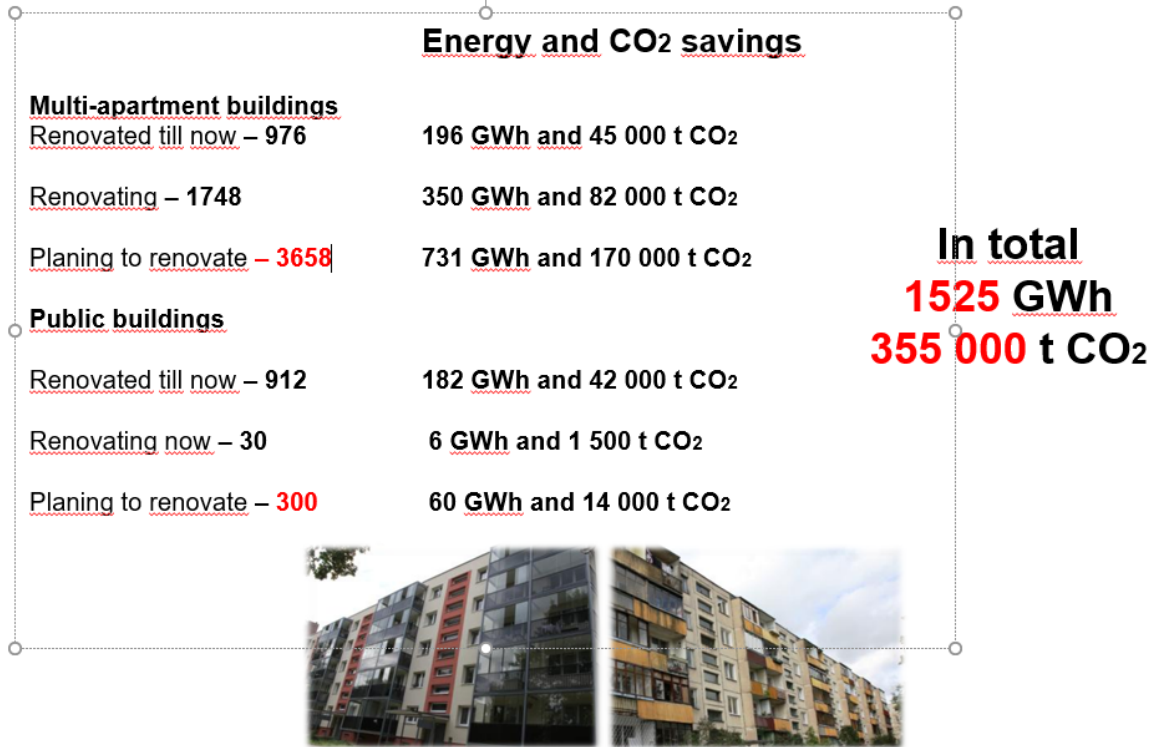
During 2000-2015 was created **more than 1500 MW** biomass capacity

600 MW were financed by EU funds

Total investment during 2007-2013 period was **225 mln. Eur**, **88,7 mln. Eur** was from EU funds.

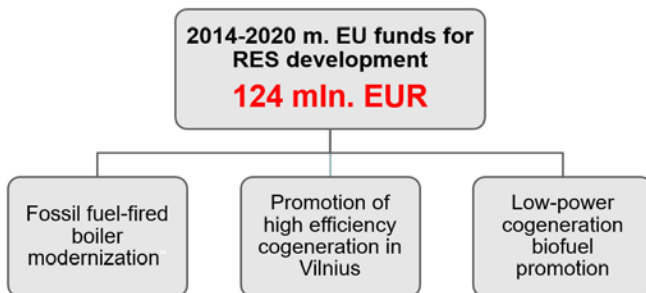
Lithuania has also launched a building renovation strategy that will allow to save important amounts of CO₂.

RENOVATION OF BUILDINGS

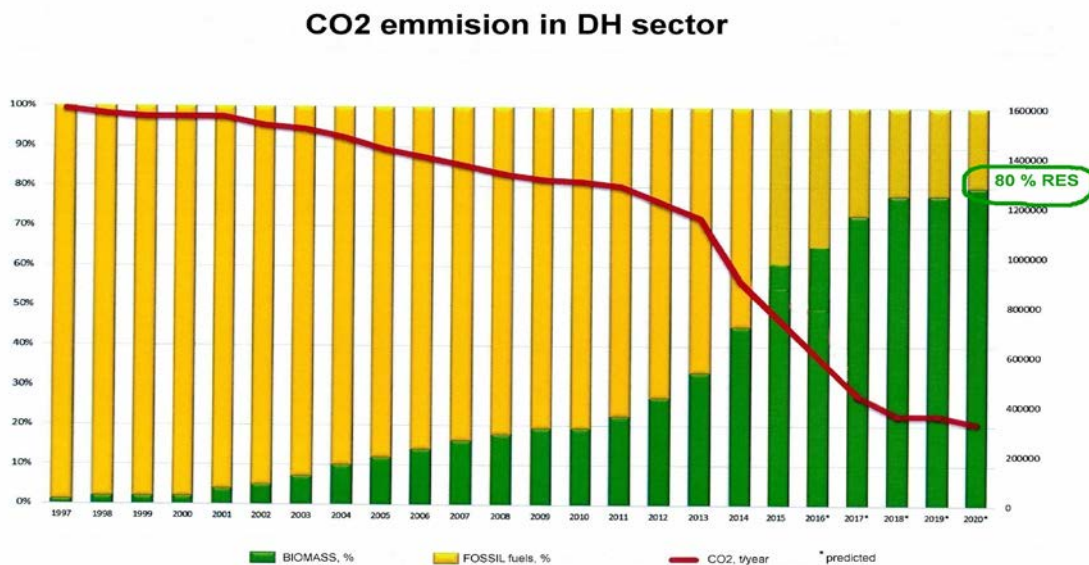


Lithuania has set up a national heat sector development program which main objective is to reduce the price of heat by 20% and environmental pollution (share of RES should achieve 80%). Lithuania has also set as objective to reduce transmission losses (huge amount of transmission lines, necessary to reduce the losses) and promote trade in energy resource exchange.

Next perspectives for biomass are summarized in below slide:



Biomass has allowed to reduce drastically CO2 emissions. The target is for RES to reach 80%.



source : LITBIOMA

Then, Mr Vidmantas Macevicius emphasized on socio-economic aspects of switching to RES sources of energy:

- Stable and low price of biomass-lower price of heat for customers
- Increasing number of jobs (now more than 6500)
- Development of technologies
- Improved cooperation of science and business
- Rural development
- Improved foreign trade balance (export of technological equipment –more than 50 mil Euro in 2015, expect 300 in 2020)
- Biomass consumption growing in industry (1300 GWh 30% of energy in 2015, expect 55% in 2020)

As a conclusion, Mr Macevicius recalled that

- District heating – 55 % of LT heating sector.
- Biomass currently constitutes 60 % of district heating. Recently – radical shift from gas.
- Increasing biomass capacities reduces heating price for consumers.
- Biomass exchange – platform for competitive biomass market (2014 – 10 % of biomass traded; 2016 – 100 % of biomass will be traded).
- Target for 2020-2021 – 80 % RES in heating fuel balance, 20 % heating price reduction.
- EU Strategy on Heating and Cooling – right step forward, we should work on concrete instruments – especially financing.

The third presentation is given by Mr Tjalling de Vries, Program Manager Heat, Ministry of Economic Affairs of the Netherlands. He gave the views of the Presidency of the Council of the EU.

To decarbonise the Dutch economy, decarbonizing the H&C sector is key, and RES-HC will be crucial. H&C plays a more and more important role in energy policies. Also, H&C has to be integrated with other energy sectors (electricity, transport, etc).

He emphasized on the fact that cooling become more and more important and that RES cooling should count towards the target. Innovation will be central as well as market uptake.

He started his presentation with a short overview of Dutch energy policies. He mentioned a major shift in policy: find alternatives to use less natural gas in the H&C sector. This is why they started an Energy Dialogue. Dutch energy minister is also minister of economic affairs. He sees a real economic opportunity in the energy transition



Netherlands energy policy

- **The Energy Agreement for Sustainable Growth 2013**

1,5% energy saving annually / 100 petajoule by 2020
 14% renewable energy in 2020, 16% in 2023
 15.000 full-time jobs

- **Energy Report 2016**

Goal: near climate neutral in 2050
 Focus on CO₂-reduction
 Cooperation in the EU, improve ETS system
 Reliable, affordable and clean energy supply
 Reduction of (own) natural gas production

- **Start of the Energy Dialogue**

www.energieakkoordser.nl/doen/engels.aspx

www.government.nl/documents/reports/2016/04/28/energy-report-transition-tot-sustainable-energy



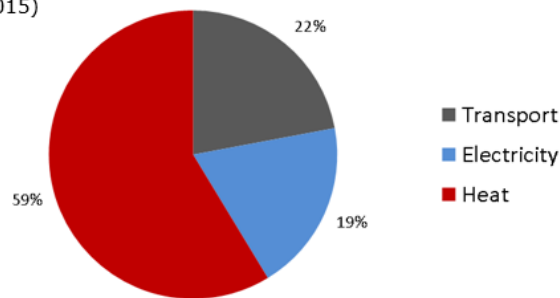
The heat supply in the Netherlands is almost entirely produced from natural gas. Insignificant portion is produced by RES or residual heat. District heating in the NL is very small. The NL is lagging behind in reaching its overall RES target (14%), so they need to tackle the heat sector.

If natural gas is to disappear, district heating, geothermal, electricity, heat pumps, biomass, biogas will have to play a more important role. Major changes have to be made as all sources are not available everywhere in the NL (regional differences).



Heating in the Netherlands

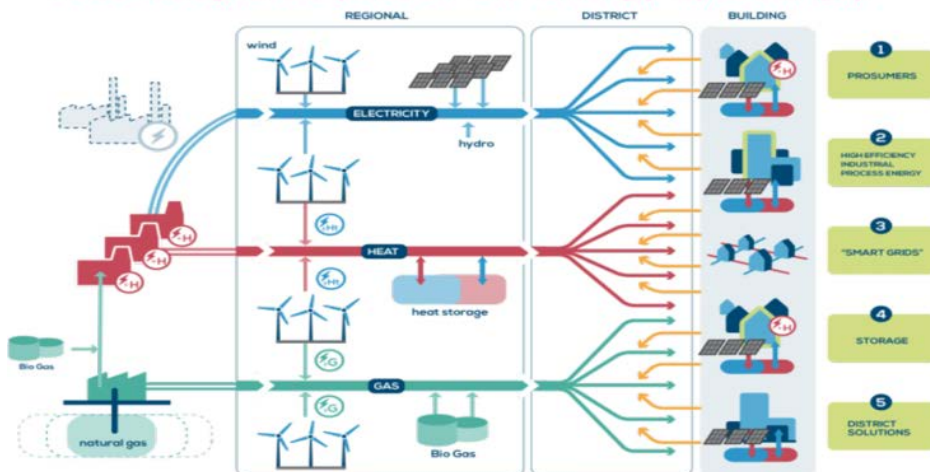
- **Heat: 59% final energy use (1200 PJ/year)**
 - ⇒ LT heat for buildings
 - ⇒ HT heat for industry
- **Production almost entirely natural gas**
 - 5.3% renewable heat (2015)
 - 5% residual heat



The future heating system is a more decentralized one, as shown in the graph below.



H&C integrated part of our energy system (2)

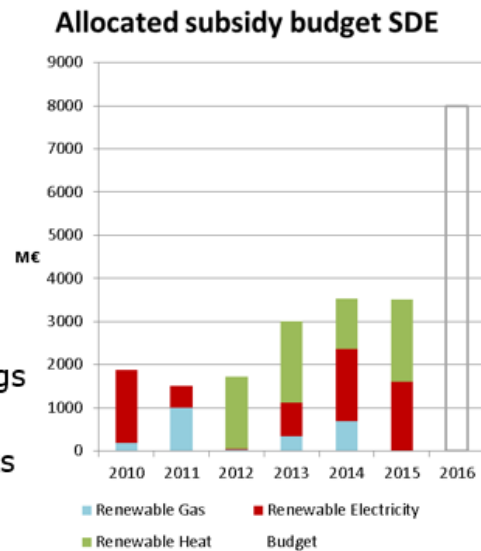


Mr de Vries mentioned policy tools to develop RES-HC:



Government instruments for renewables

- **Feed in tariff SDE+**
 - Electricity
 - Heat
 - Renewable gas www.rvo.nl/sde
- **ISDE subsidy for small systems**
 - Solar water heaters
 - Heat pumps
 - Clean biomass boilers www.rvo.nl/isde
- **Guarantee fund geothermal projects**
- **Industry agreements on energy savings**
- **Financial incentives for house owners**
- **Use of Juncker funds for heat networks**



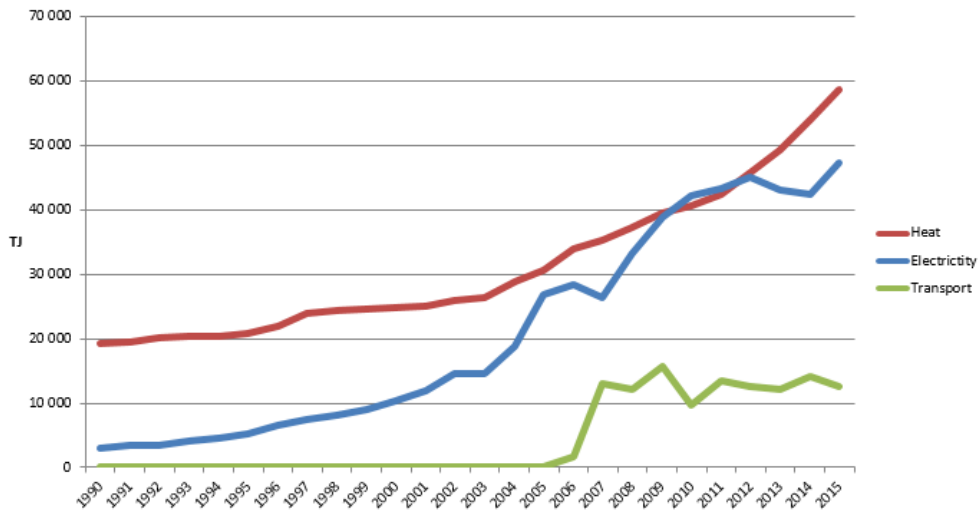
In 2012, heat was introduced as a possibility to get fund (SDE+). It grew dramatically as it is often cheapest to produce renewable heat than renewable electricity. Remarkable growth of funding for RES H&C was seen.

For smaller project, support is given through ISDE. It gave until today very good results.

These policy tools have shown good results as it can be seen in the graph vbelow. Important uptake of RES-HC.



Renewable energy production in NL



9

Then, Mr de Vries followed by presenting examples of the variety of initiatives possible when it come to the H&C sector:

- Smart energy system
- Renewable cooling
- Hybrid heat-pump
- Transition zero (buildings)
- Smart thermal grid

He also emphasized on the importance of innovation of the system, the grids, etc. EU Member States should work together on this crucial field.

As a summary:



Recap: Dutch view on H&C

- Goals of Paris Climate summit are ambitious; CO₂-emissions near zero in 2050 for EU
- Heat is 59% of final energy use in the Netherlands
- To decarbonize, renewable H&C plays a major role
- Renewables should be integrated with energy conservation and use of residual heat
- Renewable cooling should count towards targets
- To become number one, the EU should stimulate both innovation and market uptake
- The Netherlands supports the EU H&C strategy

The next presentation was given by Ms Gabriela Prata Dias, CEO ADENE, Energy Agency, Portugal.



As a project partner, she spoke on behalf of FRONt project partners and presented the policy priorities partners developed within the framework of the project.

The policy recommendations are based on a survey undertaken by project partners to identify key decisions factors of end-consumers when it comes to buying a heating installation. Having identified the main barriers to RES-HC deployment, project partners have analysed and identified policy recommendations to overcome these barriers.

These were presented to the audience by Ms Gabriela Prata Dias.

1



What policy priorities to become number one in renewable heating and cooling?

Gabriela Prata Dias
EUSEW, Brussels, 15 June 2016




2

ADENE - Portuguese Energy Agency

Government related agency, working mainly on energy efficiency and renewable energy



Mission

"To promote and perform activities of public interest in the field of energy and its related sectors"




Core competences

- Policy implementation
- Programme development
- Market monitoring
- (Big) Data management
- Technical assistance
- Dissemination & Promotion

How to make the EU number one in renewable heating & cooling
EU Sustainable Energy Week, 15 June 2016






Summary

- ✓ Level playing field for Renewable H&C in EU
- ✓ Identifying Strategic Policy Priorities
- ✓ Effective support schemes for Renewable H&C
- ✓ Clear and transparent communication with European consumers

Partners

European Trade Associations:



Energy Agencies:





Experts:





How to make the EU number one in renewable heating & cooling
EU Sustainable Energy Week, 15 June 2015







Addressing Barriers

- ✓ Financing
- ✓ Lack of awareness
- ✓ Market conditions
- ✓ Lack of strategic priorities and governance

How to make the EU number one in renewable heating & cooling
EU Sustainable Energy Week, 15 June 2015






Financing

-  ✓ Promote existing support and new financing opportunities
-  ✓ Support schemes financed 'off-budget' – long term perspective
-  ✓ Streamline administrative procedures related to support schemes

Recommendations

How to make the EU number one in renewable heating & cooling
EU Sustainable Energy Week, 15 June 2015



0

Awareness

Recommendations

✓ Dissemination and training

✓ Highlight the heating system performance and costs in EPC

✓ Promote district heating (DH) and the use of RES in DH

How to make the EU number one in renewable heating & cooling
EU Sustainable Energy Week, 15 June 2016

7

Market conditions

Recommendations

✓ Phase out fossil fuels subsidies and use in new and existing buildings

✓ Improve building codes (NZEB standard)

✓ Long term renovation strategies

How to make the EU number one in renewable heating & cooling
EU Sustainable Energy Week, 15 June 2016

8

Strategic priorities

Recommendations

✓ Long-term decarbonisation roadmap

✓ Improving data collection and reporting

✓ RD&I in renewable heating & cooling technologies

How to make the EU number one in renewable heating & cooling
EU Sustainable Energy Week, 15 June 2016

Finally, **Mr Sean Kelly, Member of the European Parliament (EPP, Ireland) gave a closing speech and an overview of the European Parliament.**

The European Parliament wish to put in place long-term strategies to decarbonise the H&C sector. He emphasized on the fact that all the policy work (RES, energy efficiency, energy security, etc) have to be consistent and should have the same goal of a long-term low carbon economy. He recalled that the gas crisis is a heat crisis and therefore we need to support the development of technologies allowing to use indigeneous and renewable sources of energy. He agrees that R, D &I is necessary and calls on the Commission to support the industry in this with clear technology roadmaps. This will help Europe to become leader in RES-HC technologies. In addition, he insisted on the numerous benefits of developing RES-HC, aside from environmental benefits: economic benefits creating growth and jobs. In fact, important investments are needed but the benefits of these investments are even higher. This should be remembered.

Another aspect that he pushed for, is the need to recognize the complementarity between energy efficiency (EE) and renewable energies. Investments in EE should go hand in hand with RES investments. These synergies should be recognized in long-term strategies towards low carbon economy. Increased and improved dialogue between the RES-HC industry, the construction sector and policy makers would be a step in the right direction.

He ended by thanking the RES-HC sector for their great work in raising the potential that is lying in the H&C sector. Without developing RES-HC technologies and putting in place the right policy framework for their increased deployment, the EU will never reach its long-term enery and climate targets.

EVENT 2: COP21-NO DECARBONISATION WITHOUT LOCAL ENGAGEMENT ON HEATING AND COOLING!

Date: 11 October 2016

Location: L42, rue de la Loi 42, Brussels



Participants:

Your organisation	First Name	Last Name
Brussel Home translator service	Abdoullaev	Hassan
AEGPL	Jaume	Loffredo
EC	Ruth	BERNABE
Aula Europe	Petja	Piilola
European Heat Pump Association	Stavroula	Stylianoudaki

Danieh Permanent Representation to EU	Asker	Ruge
Norwegian Institute of Bioeconomy Research	Bianca	Cavicchi
European Copper Institute	Nigel	Cotton
HKI	Dorothea	Kadenbach
CEZ, a. s.	Hynek	Lang
Freelance	Henriette	Gleau
European Geothermal Energy Council	Alexandra	Latham
Quercus Portugal	Luis	Moreira
Octopux BVBA	Daniela	Gomes
BCND - LIGHTHOUSE	CHRISTOS	DRONGITIS
European Commission	Pawel	Lisiak
Forest Value Investment Management	Boomer	Richard
AEBIOM	Sarah	Cohen
UPEI	Andra	Vasiu
CIMDOURO	João	Rodrigues
CIMDOURO	Paulo	Noronha
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Prahova County Council	Enescu	Rares
eu.bac	Simone	Alessandri
NS International	Shivang	Desai
Catteaux S A	Paul	Storme
ProDessus	Vasileios	CHRYSAFIDIS
European Parliament	Stefano	Spinaci
AEBIOM	Alana	Valero
Ecole Polytechnique	Nadeem	Alkurdi
TEPSA	Victor	Tanzarella
Joule Assets	Benedetta	Friso Bellemo
European Parliament	Maria Silvia	Bartolucci
U.S. Mission to the EU	Antonella	Rossetti
FleishmanHillard	Ewa	Abramiuk
ESTIF	Geoffroy	Cazenave
EBB - European Biodiesel Board	Andre	Paula Santos
MEZRI THERMOSOLAIRE research-Industry	Abdou	MEZRI
AEBIOM	Prakriti	Archambeau
Ministry of Natural Resources and Environmental Protection	KOVKHUTO	Andrei
Wetlands International EU Association	Lea	Appulo
ESTIF - European Solar Thermal Industry Federation	Anti	GKIZELIS

Tallinn City Council Office	Maie	Roomere
Tallinn City Council Office	Inga	Müür
AFICA PRESS	Kabanda	Aloys
IDAE	Andrés	Paredes
Prahova County Council	Bolocanu	Teodor
Prahova County Council	Parvu	Iulian
Prahova County Council	Popescu	Cristian
Siecle21	Decamp	Thibaut
MEP Miriam Dalli	Joanna	Incorvaja
Vattenfall	Amelie	Pans
EGEC	Luca	Angelino
ÖkoFEN	Ludwig	Van Wonterghem
Douglas Winters Associates Limited	Kevin	Hooker
MLex	emily	waterfield
Hydrogen Europe	Ivan	POZGAJ
CEDEC	Ludovica Sara	FONDI
Envihorizont LLC/Envirosan DC	Bela Ferenc	TOZSER
Baskent University	Biról	KILKIS
OneLove	Toby	Cummings
AREA	Ramiz	Kalbiyev
Climate Action Network (CAN) Europe	Jean-François	Fauconnier
Aver-Tech	Dmytro	Muravskyy
European State Forest Association	Salvatore	Martire
reitred official EC	Patrizia	Trivulzio
European Forest Institute	Harald	Mauser
Sidley Austin LLP	Jung-ui	Sul
European Parliament	Charlotte	Kellner
Municipality of Grimbergen	Piero	Piu
European parliament	Willy	Vanolst
C-Freedom Assets Management Limited	Colif	Isabor
EASME, EC	Antonio	Aguilo
eu.bac	Andrei	Litiu
European Heating Industry	Paolo	Basso
SUA Nitra	Pavol	Otepka
agroimport+	Лeжyx	Ивaн
universal press	patrick	Grignard
SUEZ Environment	Jean-Michel	RICHEZ
EOS	Silvia	Melegari
Brussels Diplomatic	olivier	bulto
Energy Cities	Alix	Bolle

Calorimetri Ltd	Joseph	Keppeln
EC / DG ENER	Jonathan	Bonadio
European Commission	Dan	Burgar Kuzelicki
Miltton Brussels	Kati	Temonen
European Parliament	Manuela	Kropp
Mission of Canada to the EU	Nicola	Waterfield
County-Association of North Rhine-Westphalia	Lennart	Rösener
County-Association of North Rhine-Westphalia	Birgit	Essling
BWE	Ulrich	Hemminghaus
Federation of Enterprises in Belgium	Olivier	Van der Maren
European Commission - INEA	Daniel	Maraver
Fédération Wallonie-Bruxelles	CARLOS	MAES
ESTeSC	Ana	Malo
Austrian Chamber of Agriculture	Claudia	Andresek
College of Europe (COe)	Olesya	GAVRYLUK
IDA International	Ana	Roios
Coalition for renewable energy and inforse	Kyle	Herman
Renewable Energy Organization	Nayereh sadat	Mirnabavi
Douglas Winters Associates Limited	Roshni	Durve
FMConsultants Associates	Fulcieri	Maltini
Cree Industries	john	olsen
Sainc Energy Limited	Kamaljit	Sood
European Organisation of the Sawmill Industry (EOS)	Diego	Benedetti
Escola Superior de Tecnologia da Saúde de Coimbra (ESTeSC)	Susana	Paixao
Association of Cities and Regions for Recycling and sustainable Resource management (ACR plus)	Doriana	Forleo
Raymon BioEnergy	Mehdi	Pourmirza
Yanmar R&D Europe	Lorenzo	Pezzola
Association for Farmers Rights Defense (AFRD)	Dr. Kakha	NADIRADZE

Agenda :



COP21-no Decarbonisation without Local Engagement on Heating and Cooling!

- *European Week of Regions and Cities* –
- *11 October 16h-18h, followed by a cocktail* –
- *L42, rue de la Loi 42, Brussels* -

16:00 - Opening session

- Welcome and short introduction: Pedro Dias, ESTIF
- Introduction speech – Setting the scene: Paula Abreu Marques, European Commission DG ENER RES Unit, Head of Unit
- Keynote speech – the Heating and Cooling Strategy: *Morten Helveg Petersen, MEP - ALDE*

16:30 - Tools and best practices

- Presentation of online tool comparing cost of heating installations developed under FROnT project – Ignacio Prieto, Creara
- Design and implementation of successful support schemes– Luca Angelino, EGECE

17:00 - Panel discussion - How to decarbonize the H&C sector while ensuring the development of local and innovative industries?

*What are the obstacles and the opportunities to develop a local and innovative RES H&C industry?
What actions, policy tools are needed?*

Panel Moderator: *Sonja van Renssen, ViEUws*

- What role for public authorities?
 - *Jonathan Fronhoffs, IBGE Bruxelles-Environnement*
 - *Lex Bosselaar, RVO Nederland*
- What role for the RES H&C industry?
 - *Stefaan Vanderstraeten, Daikin Europe nv*
 - *Michael Köhl, Fraunhofer Institute for Solar Energy Systems ISE*

Questions and Answers / Discussion

17:50 - Closing session

- Wrap-up and conclusions: Pedro Dias, ESTIF

18:00 – Networking drink

Conference summary :

The event started with an opening speech from Mr Morten Helveg Petersen (Member of the European Parliament (ALDE, Denmark)).

He referred to the current legislative framework around the H&C sector. The H&C Strategy published by the European Commission in February 2016 is a good achievement but could have been more ambitious. He referred to the upcoming “Winter Package” that he called a “tsunami of legislation” and expressed his worries regarding the holistic approach that is required when so many legislations are revised/proposed at the same time. Regarding RES, he mentioned that without binding targets, the local aspect will become more important in a bottom-up approach. Rather than having binding targets, we need to incentivize consumers and local authorities. He claimed that the local level has the potential to take up where EU is lacking ambition to achieve binding targets.

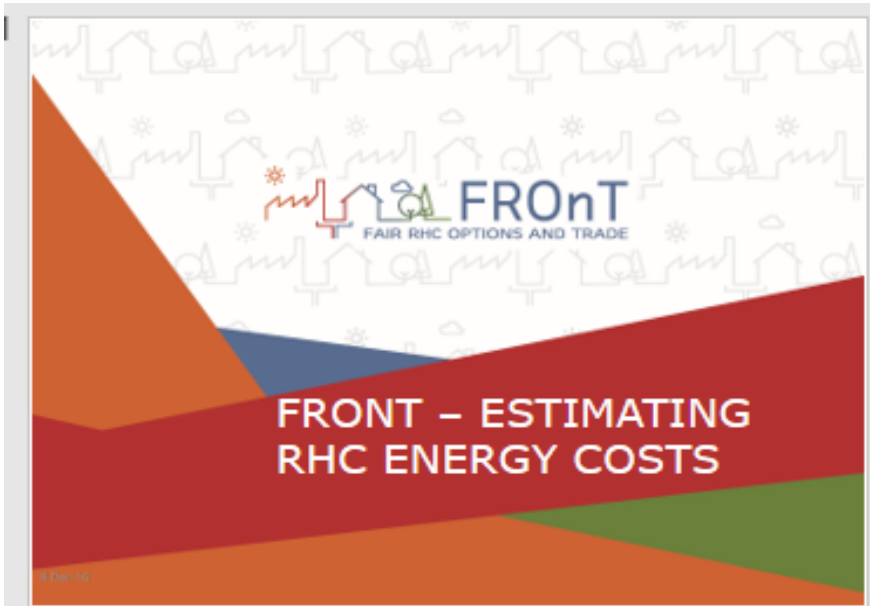
Then the event continued with the views of the European Commission and an opening speech from **Mr Jonathan Bonadio, policy officer (heat) DG ENER Renewable Energy Unit**. He replaced Ms Paula Abreu Marques that couldn't join. He started with mentioning that there will be no decarbonisation without tackling the H&C sector. Today, while RES share in the total electricity consumption is 27%, the penetration of RES in the H&C sector is much lower with only 18%. This is due to

- No dedicated strategy on H&C until today
- Unfair competition for RES-HC
- Lack of local and national strategy (H&C is decentralized sector, planning needs to be done at local level)
- Financing issue

He announced that the new Renewable Energy Directive will have a focus on H&C, triggered by the H&C Strategy published last February. Mr Bonadio also emphasized on the importance of a good coordination with the Energy Efficiency Directive (EED) and the Energy Performance of Building Directive (EPBD) to avoid technology lock-in and plan a transition to more renewables. Then he highlighted the important role of the local authorities and that not everything can be dealt at EU level.

The event was followed by two presentations from project partners.

- **Presentation of online tool comparing cost of heating installations developed under FRONT project – Ignacio Prieto, Creara**




FRONT ONLINE TOOL

The tool developed in the framework of the FROnT project assesses the competitiveness of RHC technologies by comparing the levelised costs (LCoHC) associated to them with those related to conventional fossil fuels

Four RHC technologies are analyzed: biomass, solar thermal, air source heat pumps and ground source heat pumps

The analysis is carried out in six reference locations: Austria, The Netherlands, Poland, Portugal, Spain and the United Kingdom

User interface



8-Dec-16 FROnT – Estimating RHC Energy Costs 2


FRONT ONLINE TOOL

DISCLAIMER

The FROnT tool has been simplified to make it easy for end-users.

The calculations and results provided by the tool should be supplemented by real quotes from experts on the ground.

User interface



8-Dec-16 FROnT – Estimating RHC Energy Costs 3

4

PRESENTATION OF CALCULATION TOOL

1. LCoHC and its parameters

2. Online tool

1. Structure

8-Dec-16

FRONT – Estimating RHC Energy Costs

4

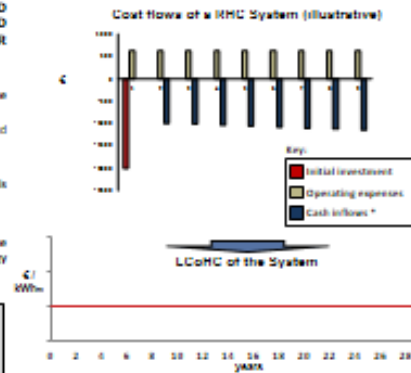
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THE LCOHC OF A SYSTEM REPRESENTS THE CONSTANT AND HYPOTHETICAL COST OF HEAT/COLD GENERATION OF THAT SYSTEM OVER ITS LIFETIME

- The LCoHC accounts for all costs associated with the RHC system over its life
 - These include initial investment, O&M costs and corporate taxes, among others
- It assumes a constant value per year and is expressed as cost per kWh.
- It considers the return required from the investment, to discount future costs (and energy generation) to present

CAVEAT

To assess the competitiveness of a given RHC technology, its LCoHC should be compared with the levelised cost of the alternative technology (i.e. accounting for the estimated future price increases)



8-Dec-16

FRONT – Estimating RHC Energy Costs

5

6

PRESENTATION OF CALCULATION TOOL

1. LCoHC and its parameters

2. Online tool

1. Structure

8-Dec-16

FRONT – Estimating RHC Energy Costs

6

7

FRONT ONLINE TOOL: STRUCTURE (1/4)

The online tool is divided into three major sections:

1. General information

The user selects the location to analyze, the user type (person or corporation) and the energy services to include in the analysis.

Three energy services are available in the tool: domestic hot water, space heating and space cooling (as a desired service)



8-Dec-16

FROnT – Estimating RHC Energy Costs

7

8

FRONT ONLINE TOOL: STRUCTURE (2/4)

The online tool is divided into three major sections:

1. Current system definition

The user is asked to fill in several key inputs related to his current (non-renewable) system

The tool includes both guidance and default values, when applicable, to ease the task



8-Dec-16

FROnT – Estimating RHC Energy Costs

8

9

FRONT ONLINE TOOL: STRUCTURE (3/4)

The online tool is divided into three major sections:

2. Renewable system definition

First, the user chooses the RHC technology to assess from those available according to the energy services selection

Then, information regarding the renewable system to be installed is requested. Guidance and default values for those inputs are included when relevant



8-Dec-16


FROnT – Estimating RHC Energy Costs

9

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FRONT ONLINE TOOL: STRUCTURE (4/4) OUTPUT

Three different outputs are provided:



LCoHC

- Two LCoHC values are given for the RHC system considering, or not, the residual value.
- Net system LCoHC is given for comparison purposes.
- The results are shown as well as a chart, including a range representing the uncertainty analysis results.

Financial output

Three parameters are provided:

- simple payback time
- net present value (NPV)
- internal rate of return (IRR)

additionally, the cumulative cash flow is shown in a chart.

Environmental output

- Greenhouse gases emissions reduction
- Energy resource consumption. A negative value means a consumption reduction and a positive value an excess in resource (both in the table and chart).

FRONt - Estimating RHC Energy Costs

Questions/comments from the audience:












- The tool is very simplified and might be too simple. In fact, people might use this tool and then go to the bank to get a loan. This is not precise enough.
→ Ignacio Prieto replied that the partners are aware of that and that was done on purpose. The tool is not made for large investments and investors to go to the bank with this, it is made to help consumers and decision-makers to understand the cost of RES-HC installations. If they have an interest in buying these technologies, they have then to contact an installer that can provide all technical and detailed information on cost.
- Other questions were asked on the calculation methodologies of the tool.


➤ **Design and implementation of successful support schemes– Luca Angelino, EGEC**



INTRODUCTION

FROnT Project Partners



 <small>Joint Institute of Technology - MIT www.mit.edu</small>  <small>Creara - Creara Research</small>  <small>European Geothermal Association - AEBION www.aebion.org</small>  <small>European Geothermal Energy Council - EDEC www.gtc.eu</small>  <small>European Geothermal Association - NUTCHRA www.aebion.org</small>  <small>European Geothermal Energy Council - EDEC www.gtc.eu</small>	 <small>E.ON Energy Research Center - E.ON Energy Research Center www.eon.com</small>  <small>E.ON Energy Research Center - E.ON Energy Research Center www.eon.com</small>  <small>Korea National Energy Commission Agency - KAPE www.kape.go.kr</small>  <small>Portuguese Energy Agency - Agência Portuguesa de Energia - ADEN www.adene.pt</small>  <small>Energy Saving Trust - EST www.energysavingtrust.org.uk</small>  <small>FROnT - FAIR RHC OPTIONS AND TRADE</small>
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 Initiative for an Intelligent Energy Europe Programme of the European Union

INTRODUCTION

Why public funds should be used to support RES-HC and interfere with the market?


- 1) To correct market failures and unfair competition
- 2) To favour the deployment of a given technology
 - support schemes should be phased out when technology reaches full competitiveness...
 - in an open internal market where a level playing field is fully established !




Supported by the Intelligent Energy Europe Programme of the European Union

PROBLEMS IDENTIFIED

From assessed support schemes & FRONt survey

- ✓ Awareness & low level of confidence in emerging markets
- ✓ Decision-making/realisation requires time
- ✓ Financing
- ✓ Low level of funding / stop & go
- ✓ Burdensome admin procedures
- ✓ Lack of professional structures
- ✓ Competing subsidies for condensing oil & gas boilers






METHODOLOGY & OBJECTIVES

Based on the assessment of 28 RES-HC support schemes in 9 EU MS

- ✦ Covering supply side and end-users
- ✦ Identification & validation of key factors
- ✦ Consultation at national and EU level
- ✦ Research of best practice beyond assessed schemes

Objectives

- ✦ Provide best examples and recommendations
- ✦ Complement the 2013 EC Guidance for the design of support schemes for RES-E
- ✦ Inspire national and regional policy-makers
- ✦ Support professionals in charge of devising and managing support schemes



KEY SUCCESS FACTORS

Essential factors :

- *Stability and predictability*
- *Transparency and accountability*
- *Balance between financial adequacy and efficiency*
- *Ensuring quality & performance*
- *Integrating different stakeholders*

Main elements for a successful support scheme

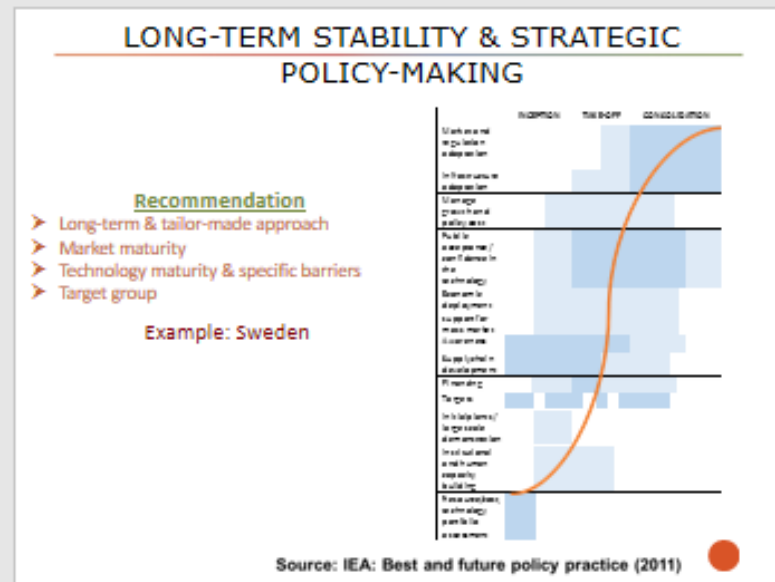
Other important factors:

- *Ensure non-burdensome administrative procedures*
- *Reduce admin. costs*
- *Provide support to applicants*
- *Communication and marketing throughout the support scheme*



CONTRIBUTION OF DIFFERENT STAKEHOLDERS

Recommendation:
Relevant stakeholders should be consulted in different phases of the decision-making process. This is to ensure the utmost transparency and can be done either through well-organised expert meetings and/or on-line public consultations.



0
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HP: EXAMPLE OF TAILOR-MADE APPROACH



Figure: Development of energy prices for the (private) end consumer in Germany (after data from Statista)

Barrier: Artificially high operating costs (electricity price)

Example of instruments: The eco-tariff ("H tariff") in Hungary

Preferential tariff for the electricity consumption of heat pumps and other renewable energy heating equipment (e.g. thermal solar collectors, circulation pumps, etc.) used for the heat supply



1
★

STABILITY & PREDICTABILITY

Recommendation:

Moving off-budget

Support financed through gas levies or alternative measures

Example:

Funding a Buildings programme through carbon tax in Switzerland

- Since 2010, a third of the CO2 tax revenue is paid to the Buildings Programme, nearly 300 million are available each year to clean buildings.
- At least two thirds of the tax revenues are for financing measures to enhance the energy performance of buildings. The rest is spent on RES, recovery of waste heat and improvement of technical facilities
- between EUR 55 and 91 million a year, is supplemented by cantonal benefits
- The Buildings Programme will continue until 2019



2
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ENSURING QUALITY & PERFORMANCE



Sustainability & safety



Consumer protection



Confidence in the technology



3

ENSURING QUALITY & PERFORMANCE (EQUIPMENT)

Recommendation

Any technical specifications which must be met in order to benefit from support schemes should be clearly predefined and appropriate certificates or standards developed at EU level should be accepted




For HP systems a pre-determined level of efficiency in terms of COP or SPF should be established in order to incentivise the most efficient systems

4

ENSURING QUALITY & PERFORMANCE (INSTALLERS)

Recommendation

Installers should be certified or have a specific equivalent qualification

Member States to ensure that certification or equivalent qualification schemes were available by 31 December 2012 for installers of small-scale biomass boilers and stoves, solar thermal systems, shallow geothermal systems and heat pumps (Art.14 RES Directive).

- List of qualified installers qualified or certified available for the public






5

ENSURING QUALITY & PERFORMANCE (INSTALLATIONS)

Recommendation

Objective testing and monitoring to know whether the systems supported can ensure good performance. Evaluations should collect information feeding back into training and qualification and certification schemes, to avoid the most common problems.

- Preventive test fields
- Random test fields
- Alternative/complementary measure: Mandatory guarantee(PT, PL)

Biomass heat
Geothermal heat
Solar Thermal heat

PROMOTING INNOVATION & EFFICIENCY

Recommendation:
Support innovative solutions in new buildings and/or through bonuses in existing buildings

Example: Germany's Market Incentive Programme

- Since April 2015 innovative designs and applications going beyond the state of the art are rewarded with an innovation bonus
- Support is also eligible for new buildings despite a minimum renewable energy obligation.
- Ex. Geothermal and air-source heat pumps achieving a SPF of 4.5 are eligible for standard support if installed in new buildings and for a higher support (more EUR 500) if installed in existing buildings

ACCOUNTABILITY

Recommendation:
Monitoring, evaluating and communicate at different intervals

Examples of evaluation criteria:

- Leveraged private investment
- Number of new installations / Renewable energy share / GHG emissions reduction
- Impact on energy poverty

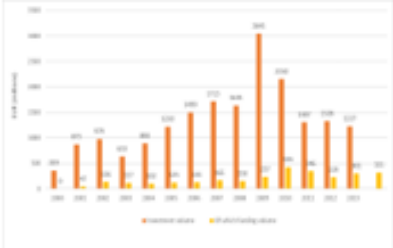
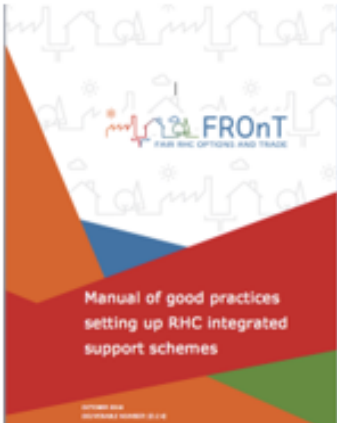


Fig. Impact on leveraged private investments of renewable energy support in the heating sector under MIP, 2000-2012. Source: ESMU, 2014

MANUAL OF BEST PRACTICES IN ESTABLISHING SUPPORT SCHEMES



... and many more good practices!

Available online:
<http://www.front-rhc.eu/library/>

Question from the audience:

- They were many abuses when it comes to subsidies to renewables (like in Belgium or the UK); what should be the right level of a good subsidy?
 - Luca Angelino replied that this is exactly the purpose of this manual, to raise this kind of issue and share the best practices. They were some mistakes but we need to learn from these mistakes. One possibility is to have subsidies in the form of tax reductions and not only grants. Member States should also learn from each other to find a good balance.

Finally, a **panel debate** with local representatives and industry representatives took place, chaired by **Sonja van Rensen**, journalist at ViEUws.

Lex Bosselaar, from RVO Nederland started with mentioning that the Netherlands is late in achieving its 2020 RES targets. They have therefore accelerated and taken actions:

- They started an Energy Dialogue with NGO, industry, government and many stakeholders to discuss a strategy for the future Dutch energy system
- New investment subsidies for small-scale RES installations
- They have opened the auctioning competition to heat producers. This works very well with an uptake of geothermal and biomass.

He mentioned that policy is lagging behind in the H&C sector and hopes that the upcoming set of legislation will address that. He highlighted that the objective for RES is not 20% but 100% and that in the future, fossil fuels should not compete with RES. He ended with emphasizing on the importance of the synergies between energy efficiency and RES in terms of communication and financing and that future policies should tackle them together.

Then, **Mr Jonathan Fronhoffs, from IBGE Bruxelles-Environnement** stated that he was very sceptical on the possible uptake of RES-HC. In Brussels, they only have now subsidies for solar thermal and there is a very low demand. He believes solar PV technology is the big winner.

Stefaan Vanderstraeten, from Daikin Europe explained how DAIKIN is investing in design and R&D in high-efficient RES heating systems. He mentioned three main issues:

- The lack of awareness on existing RES-HC solutions, not only among consumers but also EU and local policy-makers
- The need of strong building renovation strategies and regulations
- The need of support mechanisms for end-users. Over-subsidies should be avoided but also subsidies to fossil fuels (that are creating a lock-in effect in fossil heating systems).

Michael Köhl, from Fraunhofer Institute for Solar Energy Systems ISE started with saying that the cost of solar thermal technology is not only linked to the technology itself but half of the cost is linked to the installation. Still the industry can bring the cost down with efforts on the cost of material and components. An idea could be to introduce standardised components so that parts can be easily changed/exchanged.

He claimed that using solar PV to provide heat is non-sense, as it is more costly and subject to seasonal changes.

The moderator, Sonja van Renssen, opened the debate by asking how could the cost of RES-HC technologies be brought down?

- Lex Bosselaer stated that system costs can be reduced but what is important also is the cost of the alternatives. Work should be done on the cost of dirty alternatives by taxing them.
- Jonathan Fronhoffs emphasized on the efficiency of the systems that are currently low and make investment in RES-HC a risky investment. Efforts should be one on the efficiency, for the installations to work properly.
- Stefaan Vanderstraeten gave examples of what Daikin is currently doing:
 - o Train consultants, installers, architects to ensure well-installed and well-performing installations
 - o Develop software to show financial and environmental benefits throughout the lifetime of the installation
 - o Communication sessions with end users but also installers and authorities.
- Michael Köhl emphasized on the importance of training professionals but most importantly on the quality of the training that should be improved. He also mentioned that it is very difficult to foresee the economic benefit of RES-HC when oil and gas prices are so fluctuating.

On the issue of **installers**, Lex Bosselaer mentioned that in the Netherlands, manufacturers have the responsibility of installing properly the equipment. Stefaan Vanderstraeten highlighted that one possibility would be to internalize cost by having their own installers. This could bring cost down and ensure qualitative installations. Jonathan Fronhoffs mentioned that in Brussels, only certified installers can install subsidized installations.

On the issue of **awareness**, Jonathan Fronhoffs mentioned that Brussels has put in place a helpdesk for end consumers to ask their question and where they can find all the information needed. Apart from that, no other specific awareness campaigns were launched.

Then, the audience raised a question on **subsidies** and Dutch SDE+ program that make electricity and heat compete for subsidies. Lex Bosselaer replied that it worked quite well (80% of subsidies were allocated to biomass and geothermal projects). The objective for the Dutch government is to find the cheapest way to finance the uptake of RES. However, he still mentioned that there were not only positive aspects, as it seems to disturb other markets. He continued by adding that the money to subsidise RES is coming from taxes on electricity and gas but warned that if fossil fuels disappear, the income disappear as well.

Michael Köhl added to this by saying that subsidies is not the right way to go but we should rather use CO2 taxes.

Finally, the panel was asked what they believe the EU could do to increase the uptake of RES-HC?

Lex Bosselaer replied by saying that binding targets was a good option. Member States don't like detailed legislation, targets are simple and straight to the point and then Member States take the measures that they find appropriate to reach these targets.

Stefaan Vanderstraeten mentioned a big deception in the suppression of Article 8 of EED in the leaked version of EED. This article is linked to inspection of installations and is important. Stefaan Vanderstraeten is calling on the European Commission to put Article 8 back in the EED.

Michael Köhl then mentioned the importance of the EU level to maximise the synergies between RES and energy efficiency.

Finally, **Pedro Dias, Secretary General of ESTIF and FROnT project coordinator**, closed the event and concluded that there is still lots to do in the H&C sector, that the Renewable Energy Directive and other upcoming policies should have a strong focus on this sector. He ended by saying that we should capitalise on existing experiences and join efforts for a stronger uptake of RES-HC technologies.

CONCLUSION

In the framework of the project, two events were organised to disseminate the key findings of the project.

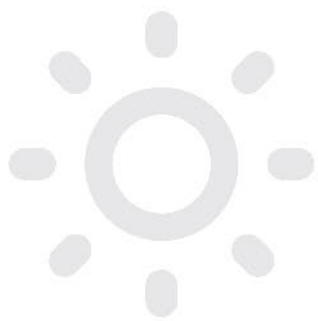
The first event was organized in the framework of the 2016 *EU Sustainable Energy Week (EUSEW)* on 15 June 2016, in the premises of the European Commission (Charlemagne Building). The event has been endorsed by the European Commission and by the presidency of the Council – The Netherlands. This event was mainly political with high level representatives from Iceland, Lithuania and Netherlands. The objective was to focus on national Heating and Cooling (H&C) strategies and best practices in decarbonizing the H&C sector, as well as presenting FROnT policy recommendations to promote the deployment of renewable heating and cooling (RES-HC) solutions.

It was a successful event, attended by more than 220 people including policy-makers, stakeholders, industry, NGO's, etc. Above discussing specific details of national H&C strategies, the main objective of the event was to attract attention on this forgotten sector with enormous potential for decarbonization and present the policy recommendations developed by the project partners. The policy recommendations are based on a survey undertaken by project partners to identify key decision factors of end-consumers when it comes to buying a heating installation. Having identified the main barriers to RES-HC deployment, project partners have identified policy recommendations to overcome these barriers. These were presented during the High Level Event in the framework of the EU Sustainable Energy Week.

The second event has been organized in the framework of the *European Week of Regions and Cities* on 11 October 2016, followed by a networking cocktail. This event presented the online tool to compare cost of technologies (WP3) and the manual of good practices for support schemes (WP2). This event was more technical, with a panel debate including local authorities and industry representatives.

It was also a successful and well-attended event that allowed good discussions and debate on the H&C sector and mainly the issues of financing (how to best support RES-HC? What can the industry do decrease the cost of RES-HC solutions), the awareness (how to raise awareness among end consumers and policy-makers) and the importance of professionals (how to inform and train better installers, architects, etc?).

The two events rightly brought attention on the H&C sector that deserve more consideration in the future policy-making.



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