

EU Energy & Climate policy: Past, present, & future

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Contents

Introduction to EU Legislation

Past: "Where we are coming from"– 2020 Objectives

Present: "Where we are" 2030 Objectives in legislation

Future: "Where we are going" EU Green Deal/Fit for 55 proposals

Exercise on making policy: Saving gas in a hurry

Summary



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Contents

Introduction to EU Legislation

Past: "Where we are coming from"– 2020 Objectives

Present: "Where we are" 2030 Objectives in legislation

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Exercise on making policy: Saving gas in a hurry

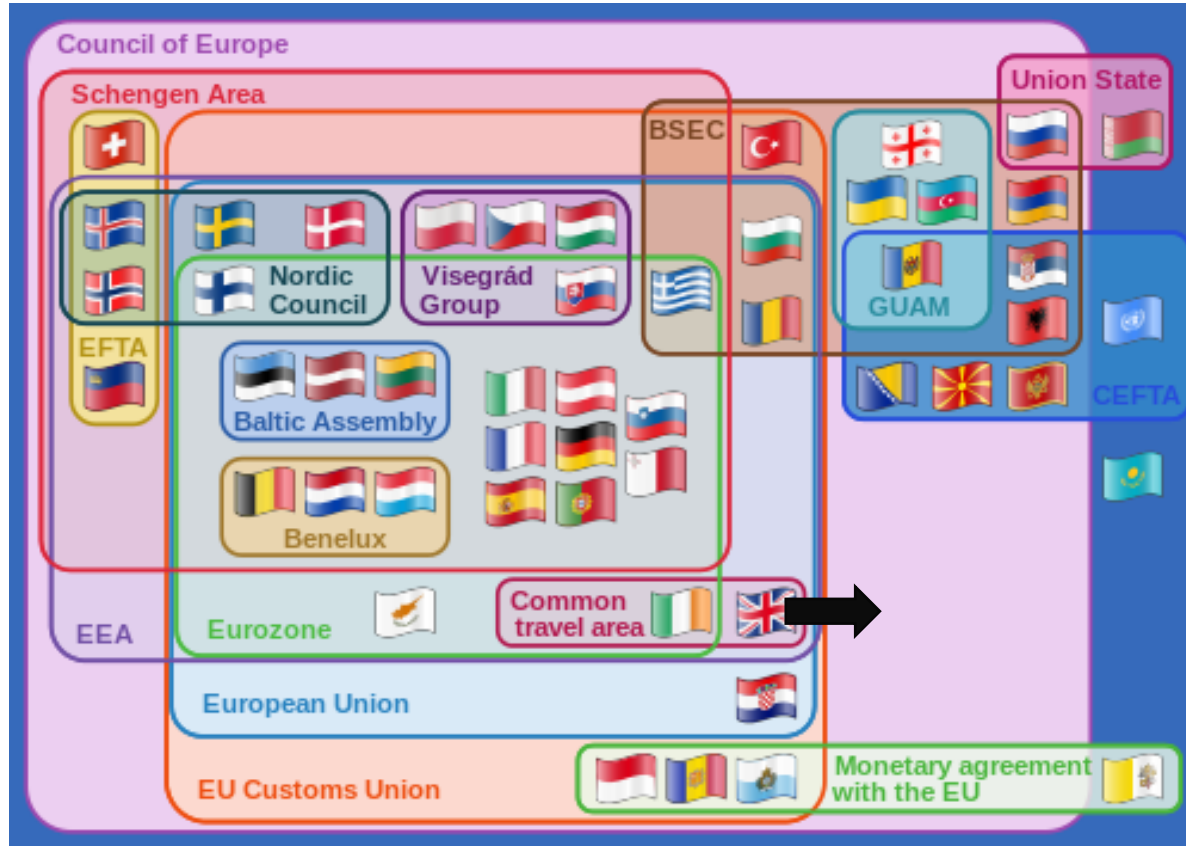
Summary



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European supranational organisations



EU legislation process

It is not simply a huge bureaucracy....



....actually only 1 EU civil servant to every 10,000 European citizens

Meaning of different terms

Legislation:

The EU only produces two types of legislation

- Directive – must be transposed into national legislation within 18 months
- Regulation – applies directly, does not need national transposition

Other EU documents:

- Green paper – tentative document of policy proposals in a broad area
- White paper- next step from green paper, more definitive document on planned policies, generally including timelines
- Communication - policy document with no mandatory authority, setting out EC thinking on a particular issue – most common type of EC policy document (but can also be found on directive proposals)
- Staff working document – Background document e.g. to a Communication – often quite useful

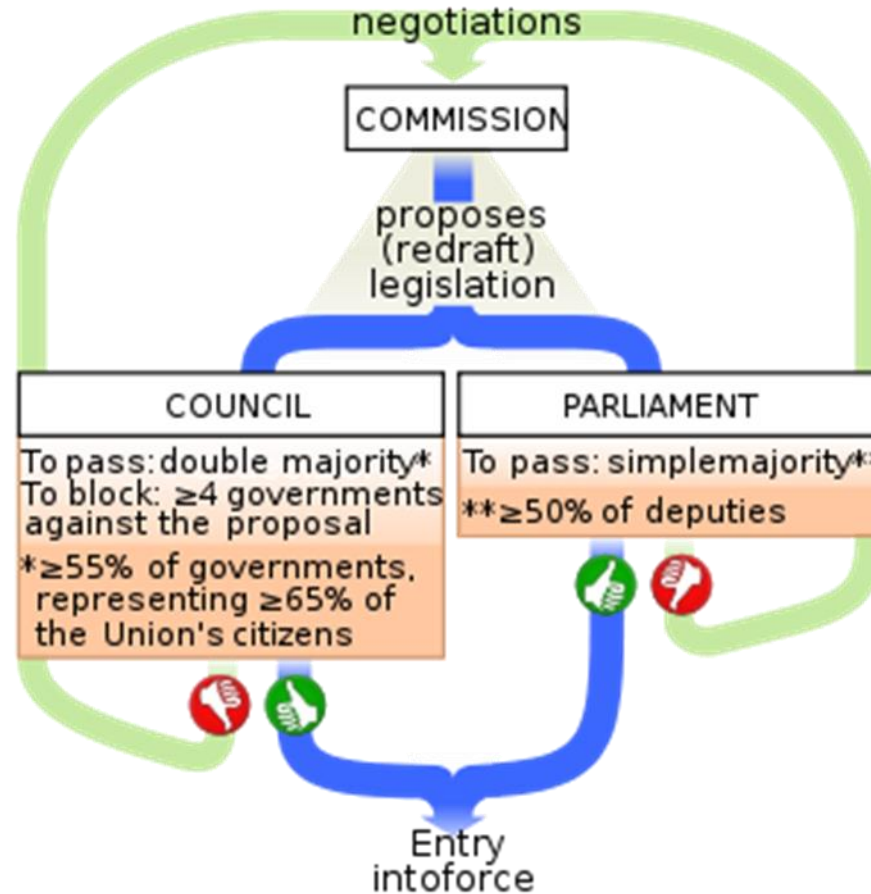
EU Legislative process

Not necessarily like this....



EU Legislative process

More like this.....



Contents

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Past: "Where we are coming from"– 2020 Objectives

Present: "Where we are" 2030 Objectives in legislation

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Exercise on making policy: Saving gas in a hurry

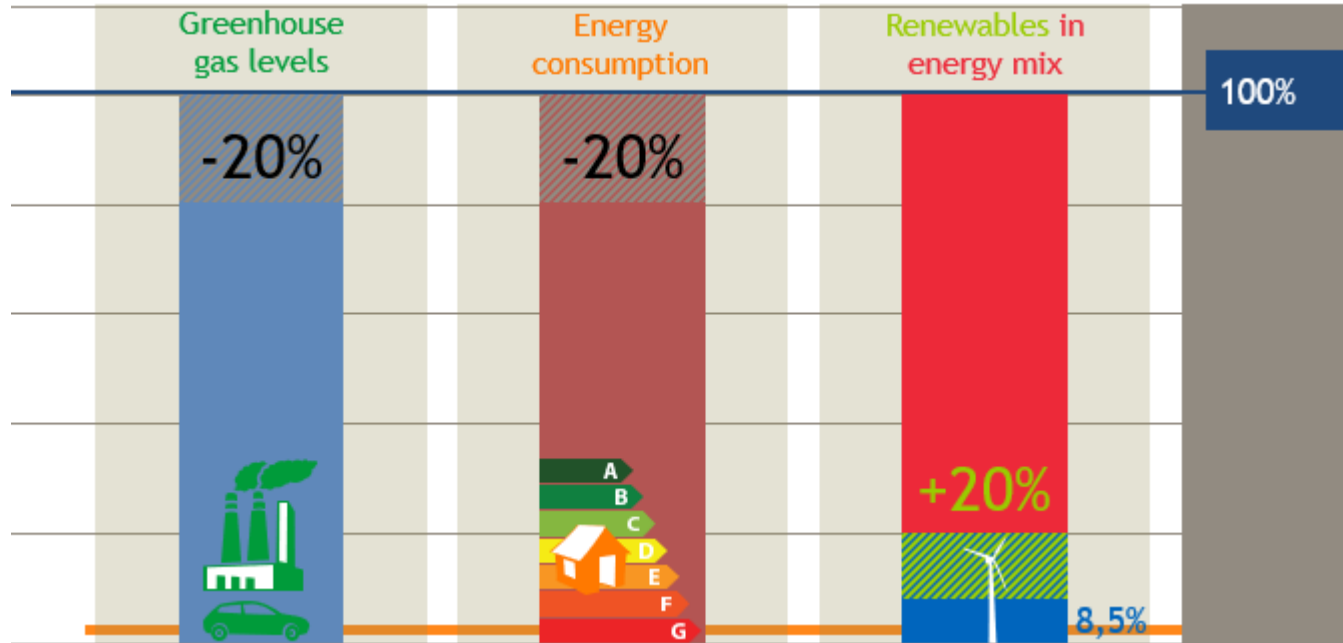
Summary



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2009 Package: 20-20-20 by 2020



**We'll go quite fast on rest of
this section**

**“Background”.....(you can look
at the slides later 😊)**



Regulation on 3rd phase of emissions trading

- **1.74% decline in emissions allowances annually from 2013 (by 2020, 21% lower than 2005)**
- **100% auctioning for power sector from 1.1.2013**
- **Other sectors: phased-in auctioning (100% by 2027)**
- **Power sector auctioning: derogation for new member states**
- **300m free emission allowances kept in reserve as aid for CCS & RES projects (allowances effectively given as a grant, the total value of which depends on the market trading price of the allowance)**

Also other CO₂ legislation:

- **Burden sharing agreement for carbon reduction in non-ETS sectors (e.g. transport, heating, agriculture)**
- **CO₂ emissions from cars - 120g CO₂ / km by 2015**

Energy efficiency directive (2012/27)

To deliver 20% lower energy consumption by 2020 compared to business as usual scenario. Example aspects (many delivered by additional regulations):

- Building renovation: e.g. 3% per year of government owned buildings
- National long-term renovation strategies for the building stock
- Energy efficiency certificates accompanying the sale and rental of buildings

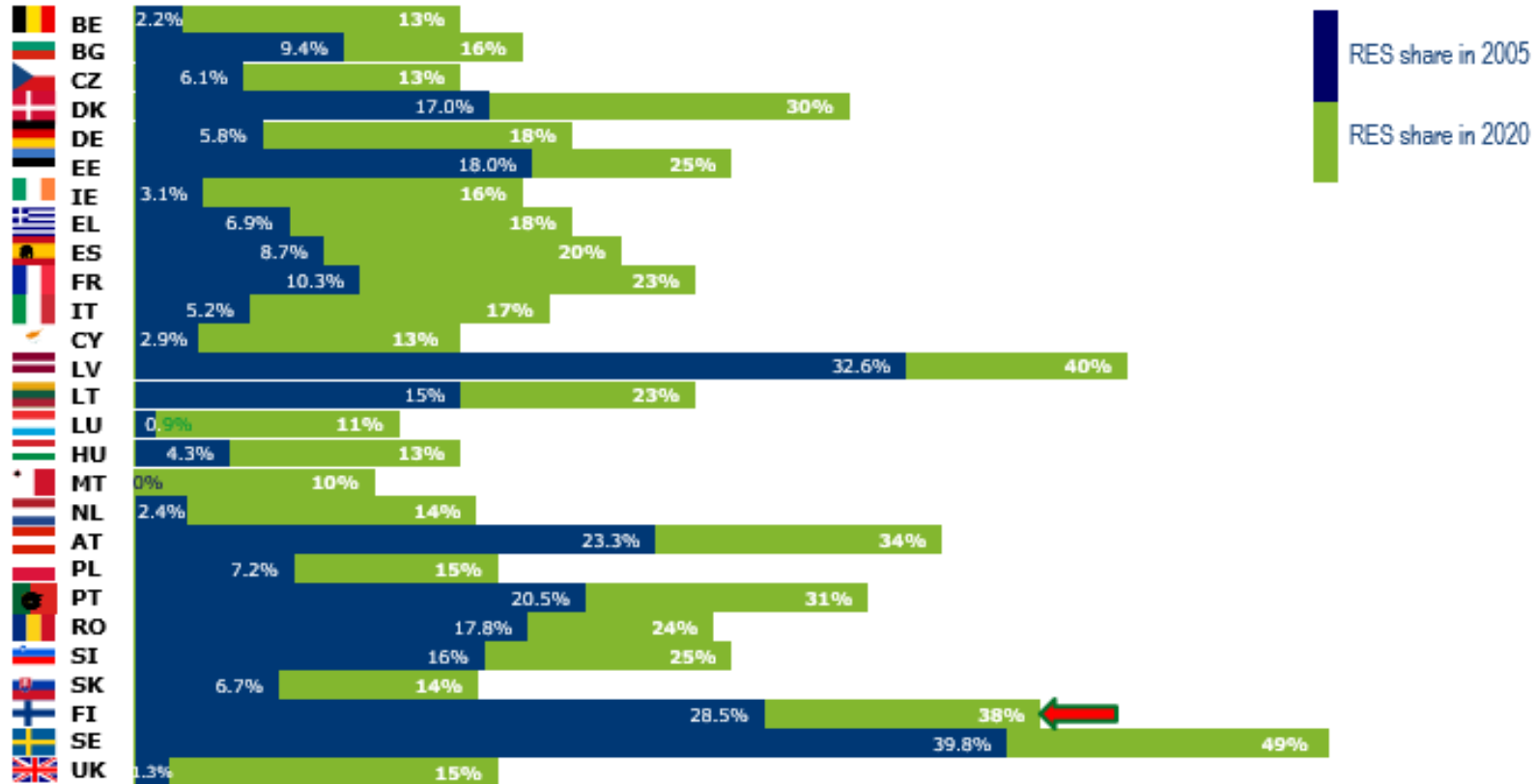
Energy efficiency directive (2012/27) (2)

- Minimum energy efficiency standards and labelling for a variety of products
- Planned rollout of close to 200 million smart meters for electricity and 45 million for gas by 2020
- Obligation schemes for energy companies to achieve yearly energy savings of 1.5% of annual sales to final consumers

Renewables directive (2009/28/EC)

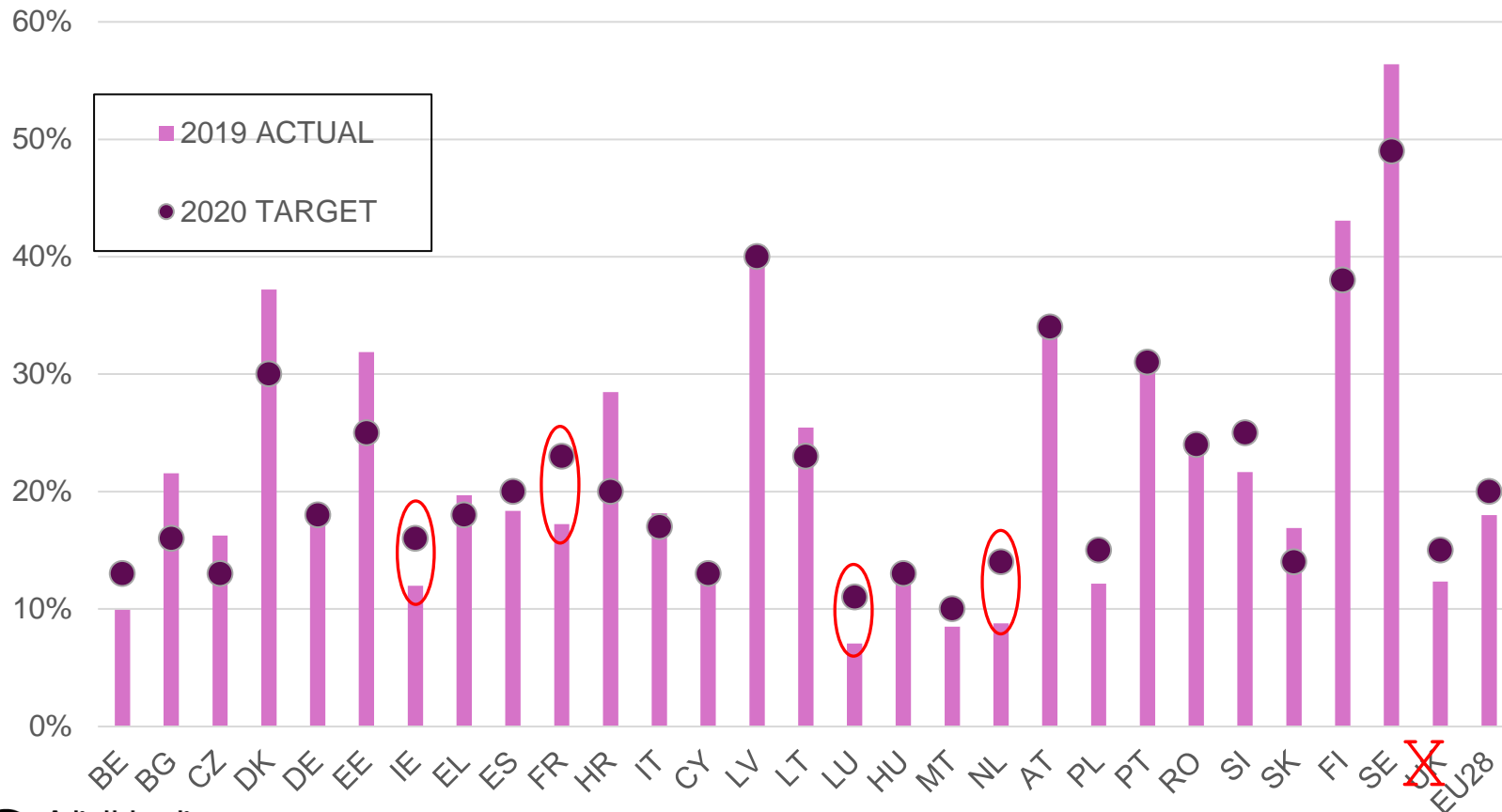
- **20% target for RES energy by 2020 (as a percentage of final energy consumption – electricity, heating, transport)**
- **10% target for RES in transport**
- **Mandatory national targets**
- Indicative national pathways
- Cooperation mechanisms
- Rules for grid access/priority dispatch for RES
- Biofuel sustainability

National RES targets to 2020



Are member states reaching their RES targets?

Not IE, FR, LU, NL....



...might it be time for those four countries to panic?

The dreaded phone call from the Commission is coming....



Cartoon made for my doctoral thesis by Richard J.L. Pope

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Summary



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Clean Energy for all Europeans package

European Commission presented proposal in November 2016, implanted into legislation by May 2019. Establishes objective to 2030 as follows:

	GREENHOUSE GAS EMISSIONS	RENEWABLE ENERGY	ENERGY EFFICIENCY	INTER-CONNECTION	CLIMATE IN EU-FUNDED PROGRAMMES	CO2 FROM:
2020	-20%	20%	20%	10%	2014-2020 20%	
2030	≤ -40%	≥ 32%	≥ 32.5%	15%	2021-2027 25%	CARS -37.5% Vans -31% Lorries -30%

Upwards revision clause by 2023

Baseline 1990

Energy Engineering

Everything else
baseline 2005 unless
stated otherwise

Source: European Commission

CEP: Legislative elements

Focus on these today

	GREENHOUSE GAS EMISSIONS	RENEWABLE ENERGY	ENERGY EFFICIENCY	INTER-CONNECTION	CLIMATE IN EU-FUNDED PROGRAMMES	CO2 FROM:
2020	-20%	20%	20%	10%	2014-2020 20%	
2030	≤ -40%	≥ 32%	≥ 32.5%	15%	2021-2027 25%	CARS -37.5% Vans -31% Lorries -30%
	Various	2018/2001	2018/2002	(Not specific)	(Various)	2019/631
	ETS, effort sharing regulation, see further slides	(recast) Renewable Energy Directive	Directive on Energy Efficiency	e.g Electricity Market Design Package		Regulation on CO ₂ emission performance standards

2030: Greenhouse gas emissions

	GREENHOUSE GAS EMISSIONS	RENEWABLE ENERGY	ENERGY EFFICIENCY	INTER-CONNECTION	CLIMATE IN EU-FUNDED PROGRAMMES	CO2 FROM
2020	-20%	20%	20%	10%	2014-2020 20%	
2030	≤ -40%	≥ 32%	≥ 32.5%	15%	2021-2027 25%	LAND USE, FOREST, AND OTHER LAND-USE CHANGE -37.5% FROM -31% TO -30%

(Upwards revision clause by 2030)

EC committed to 40% cut* in Paris Agreement (2015) > this is delivered by:

- **Revised EU ETS Directive (2018/410) > Cut in allowances of -2.2% per year from 2021-2030 (up from 1.74% from 2013-2020)**
 - **Delivers total cut in ETS sector on 43%* by 2030**
- **Effort sharing Regulation (EU) 2018/842 – 30%* in Non-ETS sector**

2030: Renewables

	GREENHOUSE GAS EMISSIONS	RENEWABLE ENERGY	ENERGY EFFICIENCY	INTER-CONNECTION	CLIMATE IN EU-FUNDED PROGRAMMES	CO2 FROM:
2020	-20%	20%	20%	10%	2014-2020 20%	
2030	≤ -40%	≥ 32%	≥ 32.5%	15%	2021-2027 25%	2020 -37.5% 2018-2020 -31% 2018-2030 -50%

2020 values based on 2013

- **(Recast) Renewable Energy Directive 2018/2001 puts in place 32% RES target for 2030**
- **Unlike the 2020 target this does not involve mandatory national targets, but a binding target at EU level**
- Directive also put in sustainability rules on use of biomass for heating and electricity (previously these rules were only in place)

2030 Energy Efficiency

	GREENHOUSE GAS EMISSIONS	RENEWABLE ENERGY	ENERGY EFFICIENCY	INTER-CONNECTION	CLIMATE IN EU-FUNDED PROGRAMMES	CO2 FROM:
2020	-20%	20%	20%	10%	2014-2020 20%	
2030	≤ -40%	≥ 32%	≥ 32.5%	15%	2014-2027 25%	2011-2020 -37.5% 2011-2020 -31% 2011-2020 -50%

- Amending directive on Energy Efficiency (2018/2002) updates 2012 energy efficiency directive (2012/27), **in order to reach 32.5% energy efficiency target for 2030**
- This implies that **energy consumption in the 2030 should be 32.5% lower than “business as usual” modelling for energy consumption in 2030** (this modelling was done in 2007, also the base for the 2012 directive)
- Otherwise, many of the measures for delivering the reductions are similar to the 2012 directive

Mid-lecture exercise – EU ETS

The slide displays the following information:

- Logos:** Aalto University Institute, Energy Institute, and Energy Research Center.
- Title:** PRICE – AND CHALLENGES OF THE EU ETS
- Graph:** A line graph showing the price of EU Emissions Allowances (EUA) from 2008 to 2017. The y-axis is labeled 'EUA price (EUR/tonne)' and ranges from 0 to 30. The x-axis shows dates from 01/2008 to 01/2017. The graph is divided into three phases: Phase 1 (2008-2012), Phase 2 (2013-2017), and Phase 3 (2018-2022). The price starts at approximately 30 EUR/tonne in 2008, drops sharply to around 10 EUR/tonne in 2009, recovers to about 25 EUR/tonne by 2010, and then shows a general downward trend with significant volatility through 2017, ending at approximately 10 EUR/tonne.
- Source:** CHARTKIT (LISECOO)

Contents

Introduction to EU Legislation

Past: "Where we are coming from"– 2020 Objectives

Present: "Where we are" 2030 Objectives in legislation

Future: "Where we are going" EU Green Deal/Fit for 55 proposals

Exercise on making policy: Saving gas in a hurry

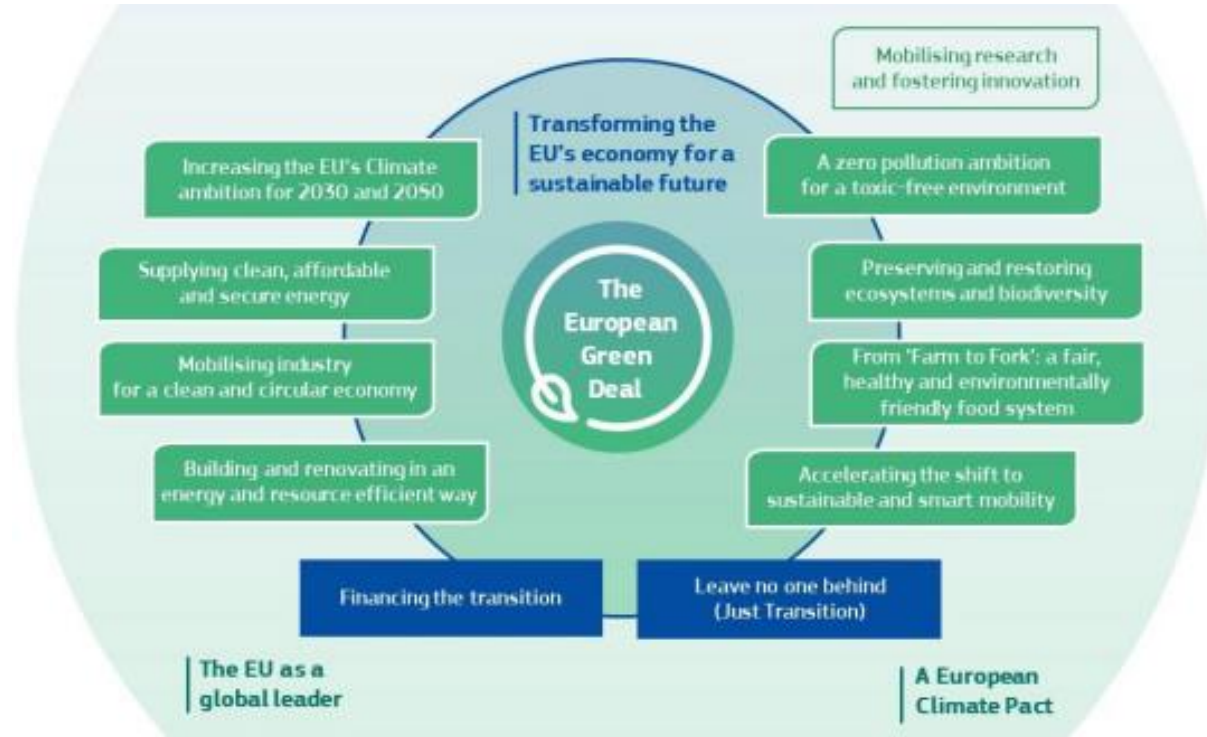
Summary



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EU Green Deal



EU Green Deal

Publication of December 2019 communication marked the start of a process of delivering proposals to deliver on the objectives set out. Thus far we have seen:

January 2020: The European Green Deal Investment Plan & Just Transition Mechanism (“Just transition” –ensuring those affected by withdrawal from carbon intensive industries are not left behind)

March 2020: European Climate law proposal

EU Green Deal (2)

March 2020: The **European Industrial Strategy** adopted

March 2020: Proposal for a **Circular Economy Action Plan**

May 2020: The **'Farm to fork strategy'**

May 2020: The **EU Biodiversity Strategy for 2030** was presented which focuses on the protection of fragile natural resources

EU Climate Law (adopted June 2021)

- **Carbon neutrality by 2050 – Pathway:**
- **New 2030 EU target for GHG emission reductions of 55% (up from 40%)**
- By June 2021, the Commission will review, and where necessary **propose to revise, all relevant policy instruments to achieve the additional emission reductions for 2030 >> this is “FIT for 55” >**
Coming next
- Setting of a **2030-2050 EU-wide trajectory** for GHG emission reductions.
- From 2023, and every 5 years, EC will assess the consistency of EU and national measures with the climate law objectives

Implementing the Green Deal:

Fit for 55

This is not an EU health & wellbeing policy for the late middle aged!!

Released 14th July 2021

Fit for 55 (2021) as compared to 2018 CEP package > could have better called it “The Great Leap forward!”

	GREENHOUSE GAS EMISSIONS	RENEWABLE ENERGY	ENERGY EFFICIENCY	INTER-CONNECTION	CLIMATE IN EU-FUNDED PROGRAMMES	CO2 FROM:
2020	-20%	20%	20%	10%	20%	
2030	≤ -40% X	≥ 32% X	≥ 32.5% X	15%	2021-2027 X 20%	-35% X Vans -31% Lorries -30%

55%

40%

39%

Focus on these today

CO2 from cars 55% reduction vs 2021 100% reduction by 2035

Fit for 55 – Whole package – note categories

Pricing	Targets	Rules
<ul style="list-style-type: none">• Stronger Emissions Trading System including in aviation• Extending Emissions Trading to maritime, road transport, and buildings• Updated Energy taxation Directive• New Carbon Border Adjustment Mechanism	<ul style="list-style-type: none">• Updated Effort Sharing Regulation• Updated Land Use Land Use Change and Forestry Regulation• Updated Renewable Energy Directive• Updated Energy Efficiency Directive	<ul style="list-style-type: none">• Stricter CO₂ performance for cars & vans• New infrastructure for alternative fuels• ReFuelEU: More sustainable aviation fuels• FuelEU: Cleaner maritime fuels
Support measures		
<ul style="list-style-type: none">• Using revenues and regulations to promote innovation, build solidarity and mitigate impacts for the vulnerable, notably through the new Social Climate Fund and enhanced Modernisation and Innovation Funds.		

NB: These are ALL proposals, not in legislation!!

A!

I will skip these next slides on details, you can have a look later...

Pricing – Revised Emissions trading system

COM(2021) 551

- Initial one-off reduction of the overall cap by 117 million allowances,
- Then annual cap reductions of 4.2% (current rate is 2.2% per year).
- Result: Reduce the emission is ETS sectors emissions by 61% by 2030 compared to 2005 levels (current target of 43%).
- Stronger Emissions Trading System including in aviation
- Extending Emissions Trading to maritime sector (from 2023), fuels for road transport and buildings (from 2025)

Pricing - Carbon Border Adjustment Mechanism

COM/2021/564

- **Entirely new! Imports to be subject to carbon pricing**
- **To prevent carbon leakage (when production transferred from EU to countries with lower emissions reduction targets)**
- **Mechanism to set a price on imports of certain products based on their carbon content (unless importers can evidence that a carbon price has already been paid during production).**

Targets - Amended Renewable Energy Directive

COM/2021/557

- **Increase current 32% binding target to 40% of renewables in the EU energy**
- **Fostering renewables based electrification**
- **Promoting the uptake of renewable fuels, such as clean hydrogen where electrification challenging (certain industrial and transport sectors)**

Targets - Updated Effort Sharing Regulation

COM/2021/555

- Reduce emissions in non-ETS sectors
- Moving from previous 32.5% target to 40% target for 2030 vs 2005
- Binding emissions reduction targets on Member States in several sectors (buildings, road and domestic maritime transport, agriculture, waste and small industry sectors).

Targets – Updated energy efficiency directive

COM/2021/558

- **2030 target to increase from 32.5% (for both primary and final energy consumption)**
 - **to 39% (for primary energy consumption)**
 - **to 36% (for final energy consumption)**
- **Each Member State will determine its indicative national contribution (based on a formula of criteria and benchmarks)**

Rules: strengthening the CO2 emission performance standards for new passenger cars and new light commercial vehicles COM/2021/556

Reduce the average emissions of new cars

- by 55% from 2030
- by 100% from 2035
(compared to 2021 levels)

However....does not address vehicle size...



Implementation of Fit for 55 package

Commission presents Fit for 55% (1) proposals

European Parliament & Council form positions

European Parliament, Council, Commission negotiate final agreement

H2 2021

Slovenia presidency

H1 2022

France presidency

H2 2022

Czechia presidency

H1 2023

Sweden presidency

H2 2023

Spain presidency

H1 2024

Belgium presidency

Leadership vacuum in DE then potentially FR due to national elections

Commission presents Fit for 55% (2) & circular economy proposals

European Parliament & Council form positions

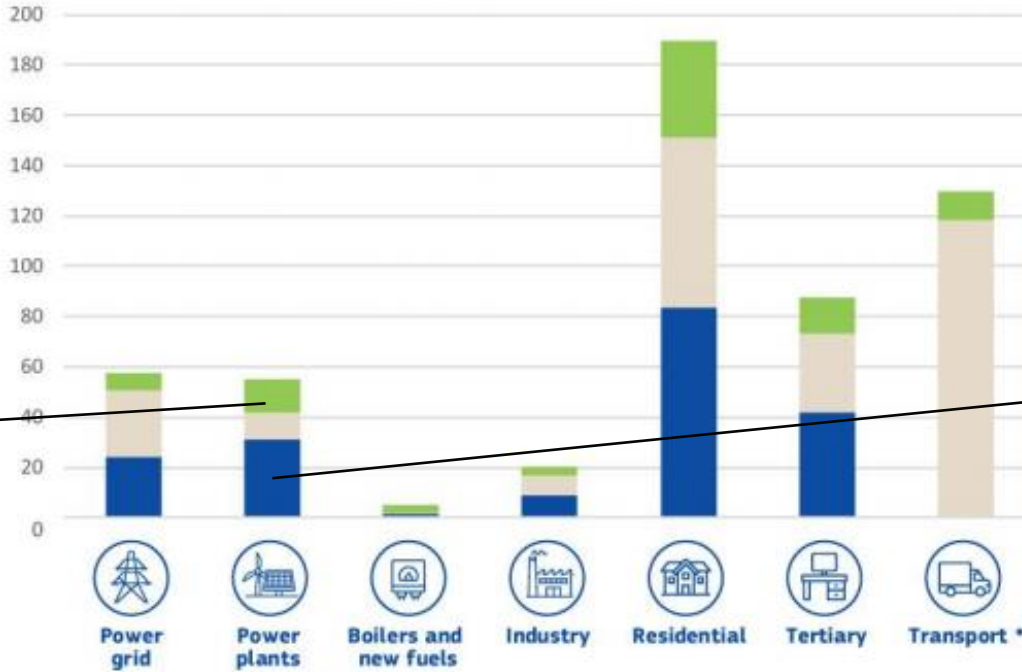
European Parliament, Council, Commission negotiate final agreement

Key deadline on negotiations: European Parliament elections



The 55% question: Investment requirements > Looking forward and backwards

Forwards:
Foreseen Investments in power sector need to be doubled 2021-30 when going from 40% to 55% target



Backwards: But total investment 2021-2030 would be similar to previous high investments in 2011-2020 period = it looks “doable”

- Additional to achieve -55% greenhouse gas reductions, 2021-2030
- Additional under current 2030 policies in 2021-2030 compared to 2011-2020
- Historic annual investments in the energy system 2011-2020

* transport only shows additional investment

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Present: "Where we are" 2030 Objectives in legislation

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Exercise on making policy: Saving gas in a hurry

Summary



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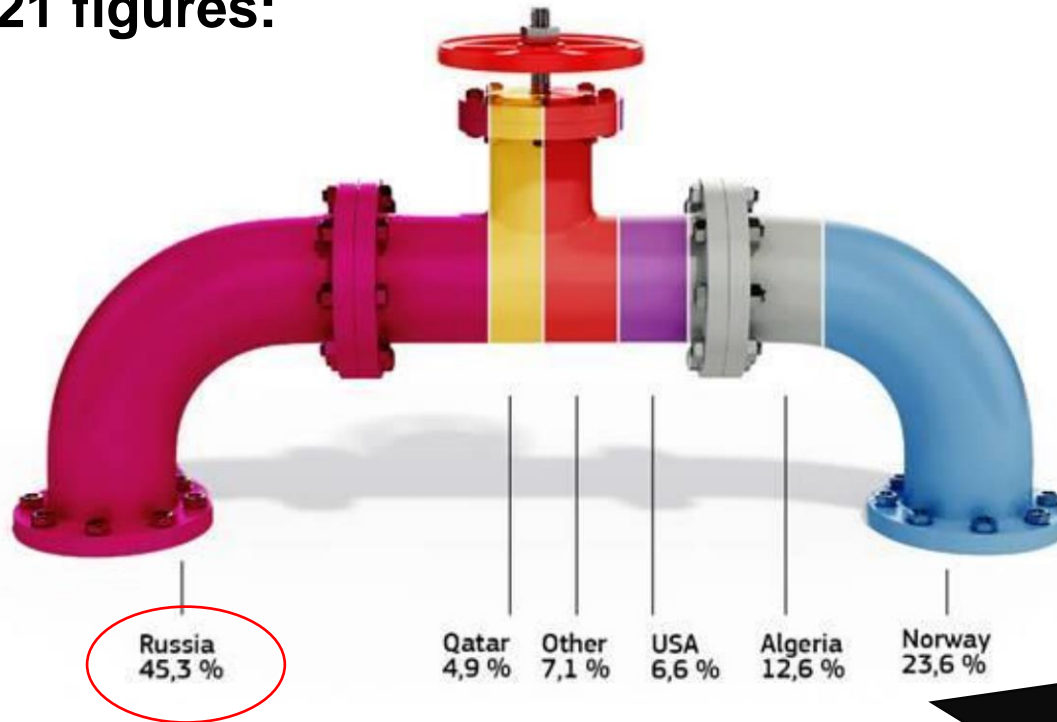
Saving (Russian) gas in a hurry

– Group exercise

Introduction first...

Where do we source our gas in EU?

2021 figures:



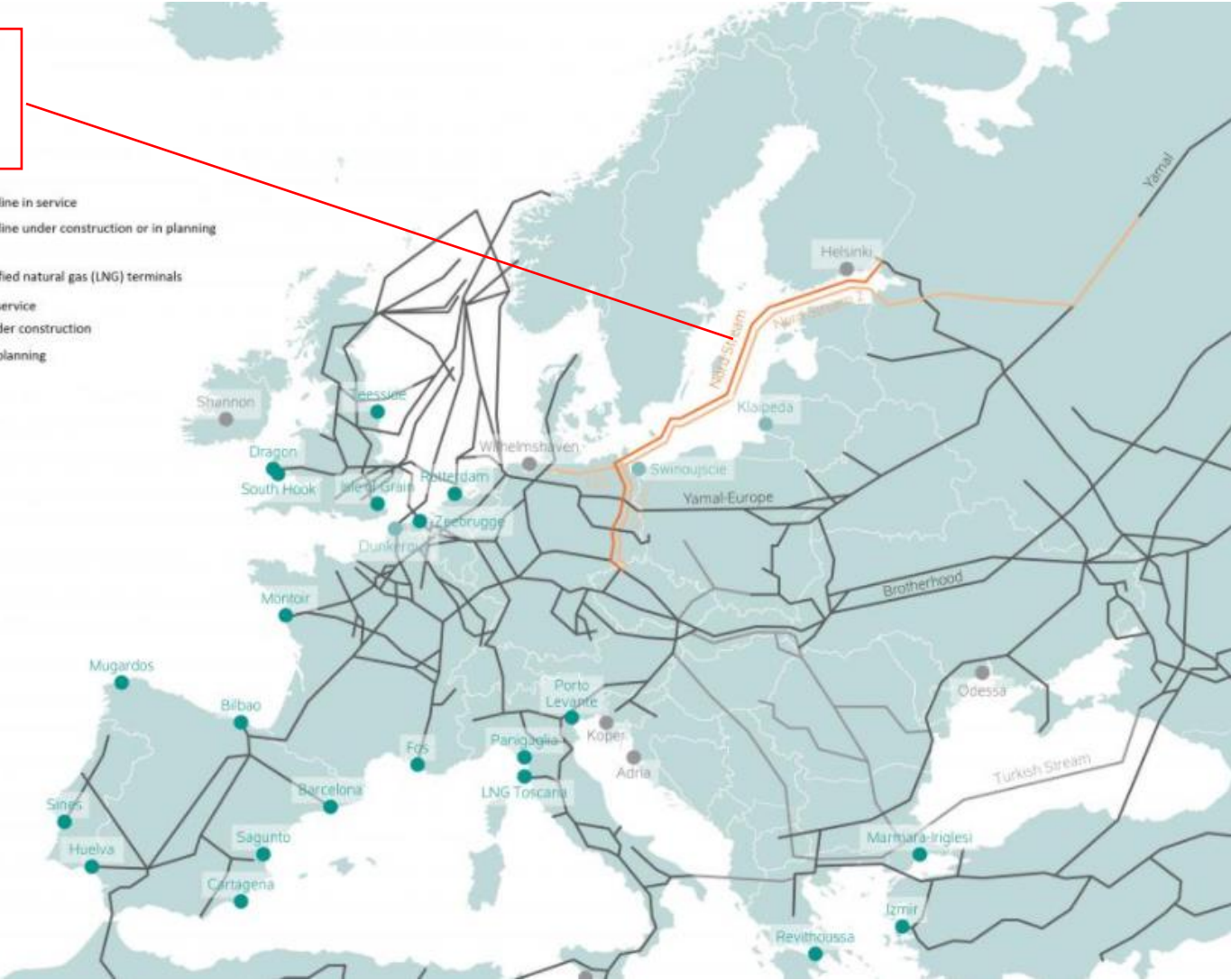
It's been getting worse, data for 2017:



European gas network

Nordstream 1&2
Russia >
Germany

- Pipeline in service
- Pipeline under construction or in planning
- Liquefied natural gas (LNG) terminals
 - ...in service
 - ...under construction
 - ...in planning



Gas and politics; Nordstream

Nordstream was built as a way to transfer gas Russia to Germany bypassing countries with which Russia has "difficult" relations, such as Ukraine

It was built after a bilateral agreement between former German chancellor Gerhard Schröder and Vladimir Putin

In some ways surprising it was done given variable relations EU vs Russia.

And what was Schröder's job after leaving office?



Soon after stepping down as chancellor, Schröder accepted Gazprom's nomination for the post of the head of the shareholders' committee of Nord Stream AG

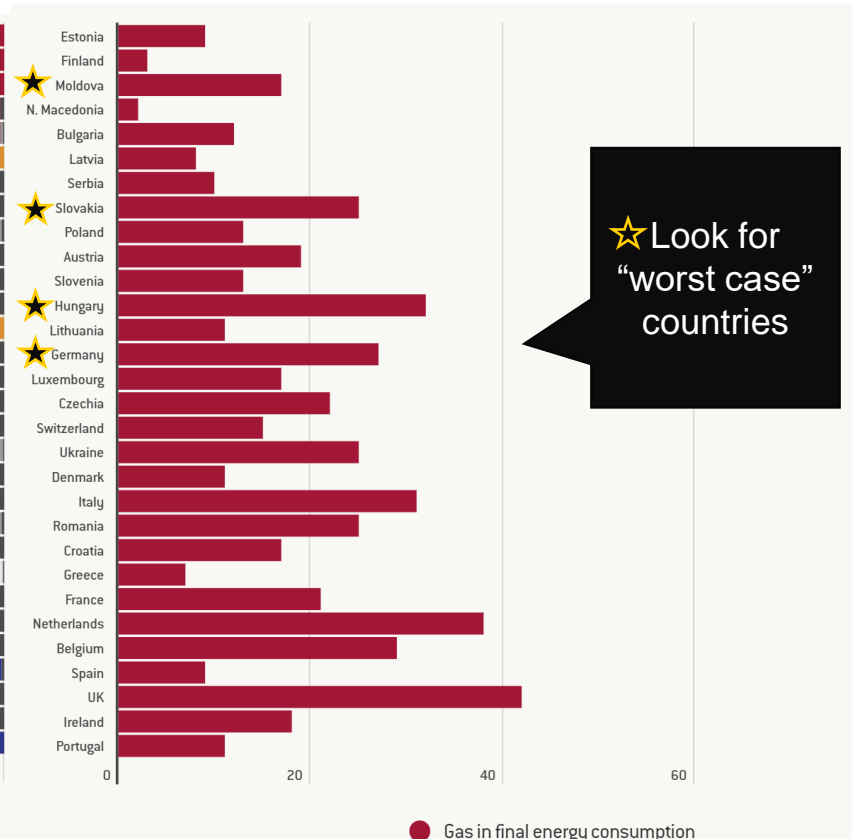
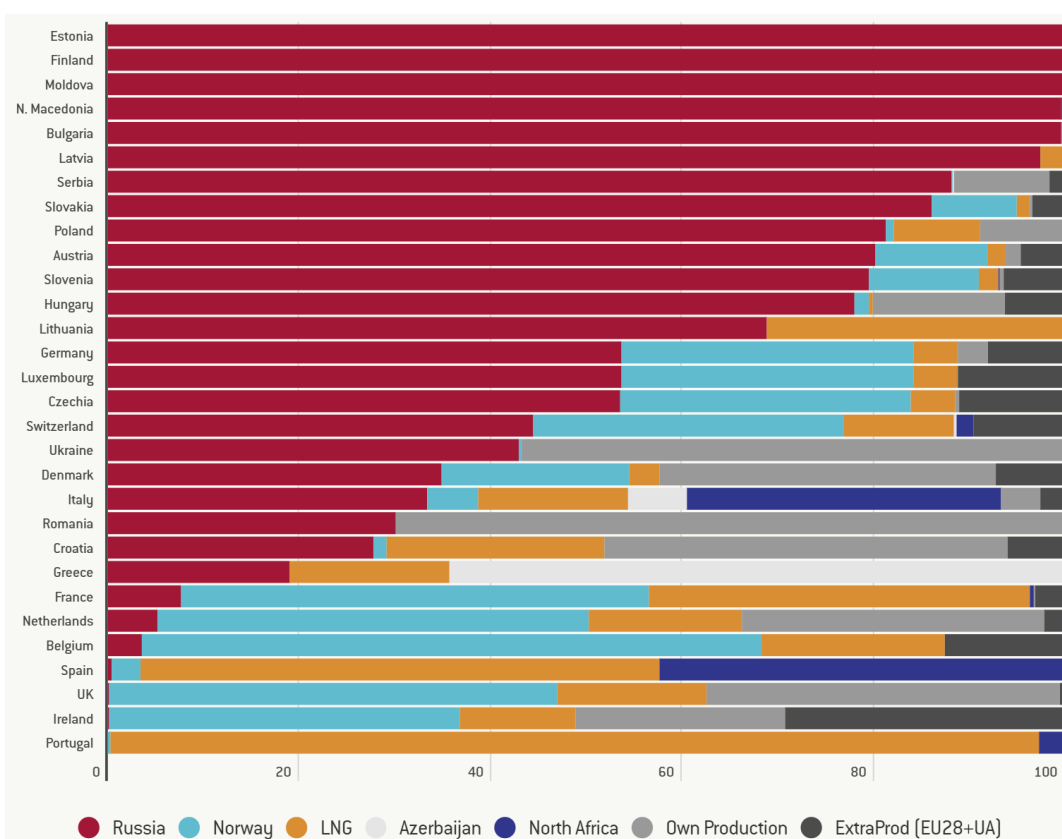


Today: How is the situation of different European countries?

(2020/2021 data)

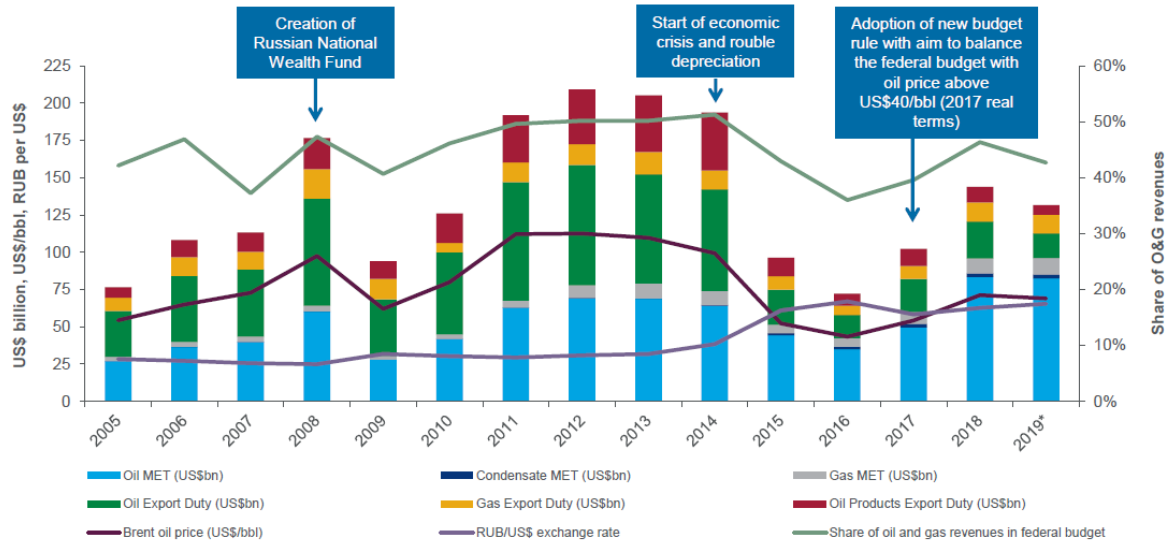
Import share

Gas dependency



Oil & Gas sales revenue is critical to the Russian economy

Evolution of federal budget oil and gas revenues



Source: Russian Federal Treasury, Wood Mackenzie (2019 figures estimated)

Gas revenues are easier to tackle than oil as Russia cannot simply sell the gas to elsewhere if we don't buy it, movement of gas restricted by pipeline infrastructure (and for LNG, terminal capacity, but Russia exports over 80% of gas by pipeline)

Exercise: Reducing Russian gas use in a hurry

- **Divide into your groups, and figure out measures you can take to reduce Russian gas use as:**
 - Energy consumer
 - Energy producer (company)
 - Industry
 - Government
- **Go to premo.aalto.fi/russiagas to fill in your ideas**
- **7 minutes to complete**

What is the EU planning?

REPower EU communication, 8.3.22: EU Action plan to reduce Russian gas import

Background:

Total Russian gas imports, 155bcm

Existing Fit for 55 measures will reduce gas use by 100 bcm by 2030

Reducing Russian gas import by 100 bcm by end 2022 looks possible but very tough practically and economically

REPOWER EU TRACK	FOCUS	FF55 AMBITION BY 2030	REPOWEREU MEASURE	REPLACED BY THE END OF 2022 (BCM equivalent) estimate	ADDITIONAL TO FF55 BY 2030 (BCM equivalent) estimate
<u>GAS DIVERSIFICATION</u>	NON-RU NATURAL GAS	-	LNG diversification	50	50
		-	Pipeline import diversification	10	10
	MORE RENEWABLE GAS	17 bcm of biomethane production, saving 17 bcm	Boost biomethane production to 35bcm by 2030	3.5	18
		5.6 million tonnes of renewable hydrogen, saving 18.5 bcm	Boost hydrogen production and imports to 20mt by 2030	-	25-50
<u>ELECTRIFY EUROPE</u>	HOMES	Energy efficiency measures, saving 38 bcm	EU-wide energy saving, e.g. by turning down the thermostat for buildings' heating by 1°C, saving 10bcm	14	10
		<i>Counted under overall RES figures below</i>	Solar rooftops front loading – up to 15 TWh within a year	2.5	frontloaded
	30 million newly installed heat pumps installed in 2030, saving 35 bcm in 2030	Heat pump roll out front loading by doubling deployment resulting in a cumulative 10 million units over the next 5 years	1.5	frontloaded	
	POWER SECTOR	Deploy 480 GW of wind capacities and 420 GW of solar capacities, saving 170bcm (and producing 5.6 Mt of Green Hydrogen)	Wind and solar front loading, increasing average deployment rate by 20%, saving 3bcm of gas, and additional	20	Gas savings from higher ambition counted under green hydrogen, the rest is frontloaded
<u>TRANSFORM INDUSTRY</u>	ENERGY-INTENSIVE INDUSTRIES	Front load electrification and renewable hydrogen uptake	Front load Innovation Fund and extend the scope to carbon contracts for difference	Gas savings counted under the renewable hydrogen and renewables targets	

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Introduction to EU Legislation

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Summary



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Summary & Outlook

- **Reminder: Energy & Climate policy in Europe is primarily from EU, not national level**
- **2020 targets look like being met**
- **2030 objective (at 40% GHG cut) were reasonably ambitious and fully in legislation by 2019.**
- **EU Green Deal/Fit for 55 objective of 55% GHG cut by 2030 (and carbon neutrality by 2050) has required complete revision of 2030 legislation...within 2 years of their finalisation in 2019!**
- **Climate and energy spending play a major role in EU COVID-19 recovery funds**
- **EU has possibility for cutting Russian gas import fast but it will be very tough, but hopefully both public and political will is there**

Many thanks!

Remember to fill in the lecture feedback question in presemo!



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