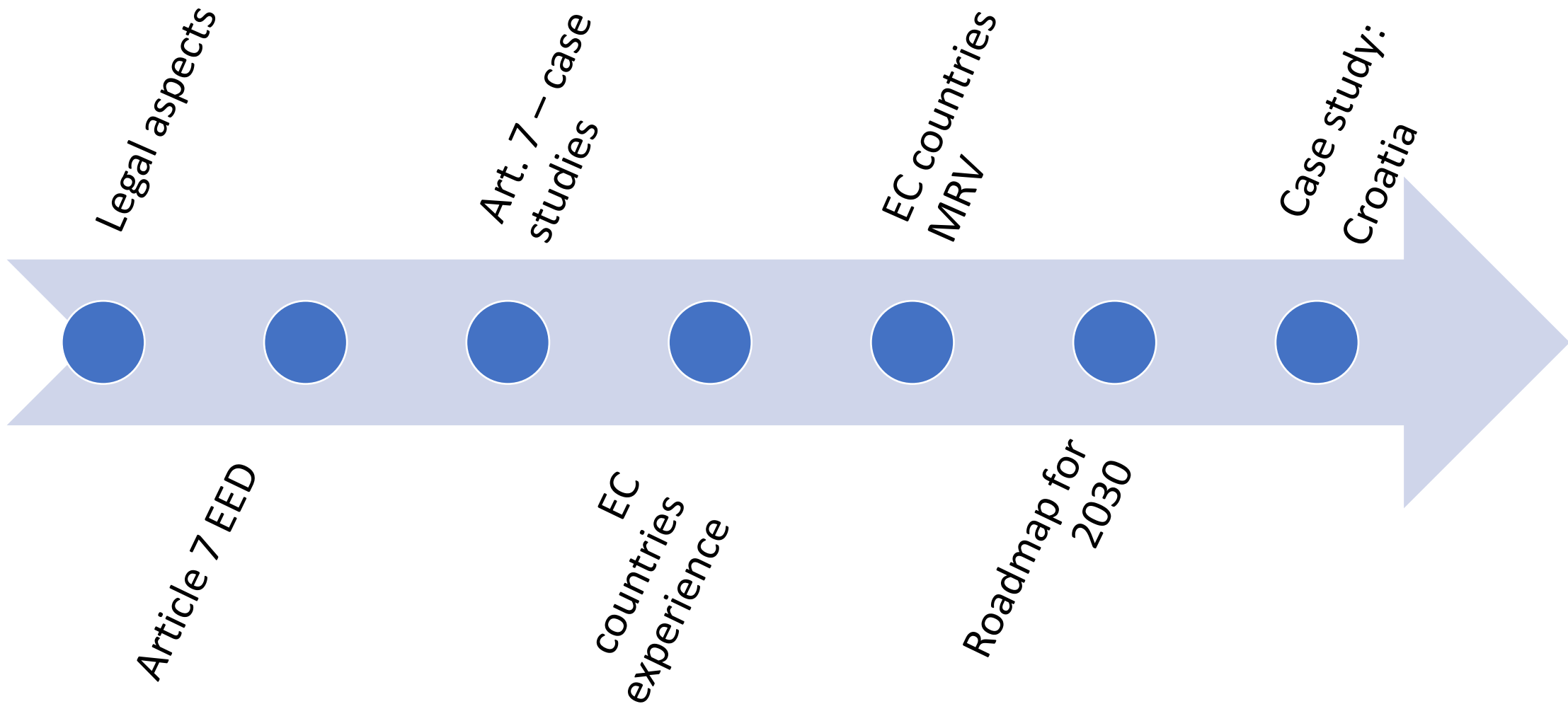


Institutional, organizational and
legal aspects of energy
management and monitoring,
reporting and verification at the
global and EU levels

Table of contents



EU directives

- Energy efficiency Directive
- Energy savings goal 32.5% to 2030
 - Several different measures, for example:
 - Obligation to renovate 3% of public buildings + long term plan for renovation of other buildings
 - Rollout of 200 million smart meters
 - Obligations regarding the energy certification (buildings, appliances, etc.)
 - Large companies need to make the energy audits
 - Protecting the rights of consumers to receive energy consumption data
 - Obligations schemes for energy companies (e.g., energy retailers) to achieve yearly energy savings

EU Green Deal

- The evaluation of the Directive (in progress)
- Revision of the Directive (second quarter of 2021)

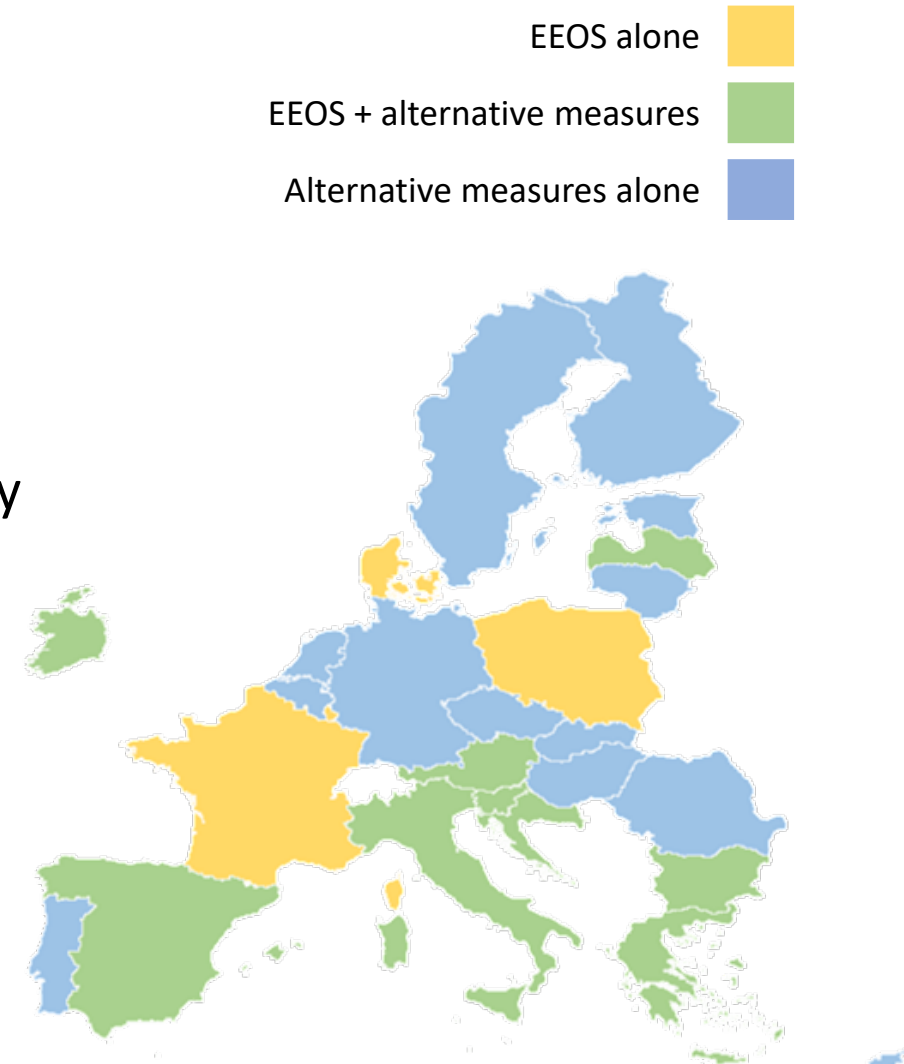
- Governance of the Energy Union and Climate Action
- Integrated national energy and climate plans
 - Decarbonisation (greenhouse gas reduction and renewables)
 - Energy security
 - • Energy efficiency
 - Internal energy market
 - Research, innovation and competitiveness

Article 7 EED

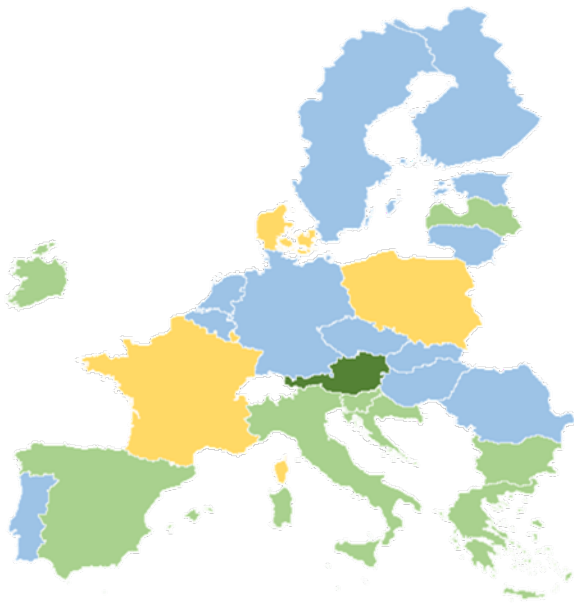
2012 Directive	2018 updates
Annual reduction of 1.5% in national energy sales 2014 – 2020	0.8% annual final energy consumption averaged over the most recent three-year period prior to 1 January 2019
<ul style="list-style-type: none">• Principles to apply to the calculation of additionality to European Union law• Materiality of the activities of obligated, participating or entrusted parties• A requirement to ensure that quality standards for energy efficiency measures• A methodology for the notification of energy efficiency measures to the European Commission	<ul style="list-style-type: none">• Elevates the issue of energy poverty• Clarifies the requirements regarding the lifetimes of measures and additionality when calculating energy savings• Emphasizes the importance of monitoring and verification in ensuring that policy measures achieve their objectives

Article 7 EED implementation

- Companies have to carry out measures which help final consumers improve energy efficiency (**EEOS**).
- EU countries may also implement **alternative** policy measures which reduce final energy consumption, such as:
 - Energy or CO₂ taxes (e.g. Sweden)
 - Financial incentives that lead to an increased use of energy efficient technology
 - Regulations or voluntary agreements that lead to the increased use of energy efficient technology
 - Energy labelling schemes beyond those that are already mandatory under EU law (e.g. ISO50001)
 - Training and education, including energy advisory programmes



Case study – Austria (EEOS)



EEOS alone



EEOS + alternative measures

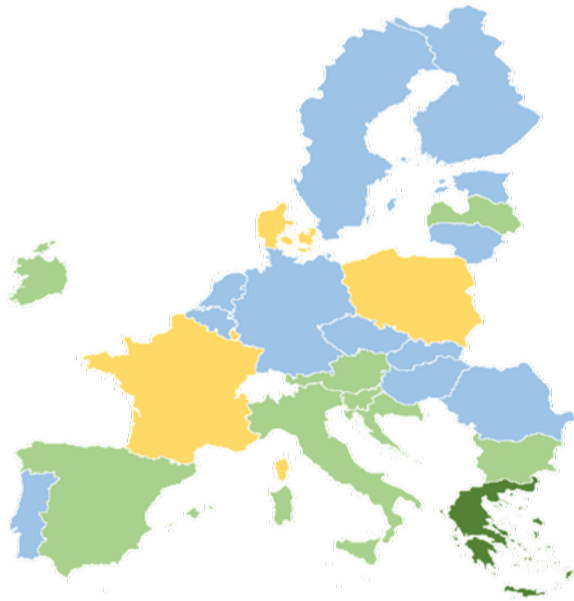


Alternative measures alone



- The EEO scheme started in January 2015
- The targets are set annually as 0.6% of the reported final energy consumption
- 40% of the target has to be achieved in the household sector (housing or transport)
- The energy savings reported between 2014 and 2017 for Article 7 of the EED (from EEOs and alternative measures (AMs)) contribute 136 PJ (cumulatively) to the savings target of 218 PJ for 2020
- 37.3% of the achieved energy savings derive from actions in households (all actions)
- In households affected by energy poverty, the resulting end-use energy savings are multiplied by the factor 1.5

Case study – Greece (EEOS)



EEOS alone



EEOS + alternative measures

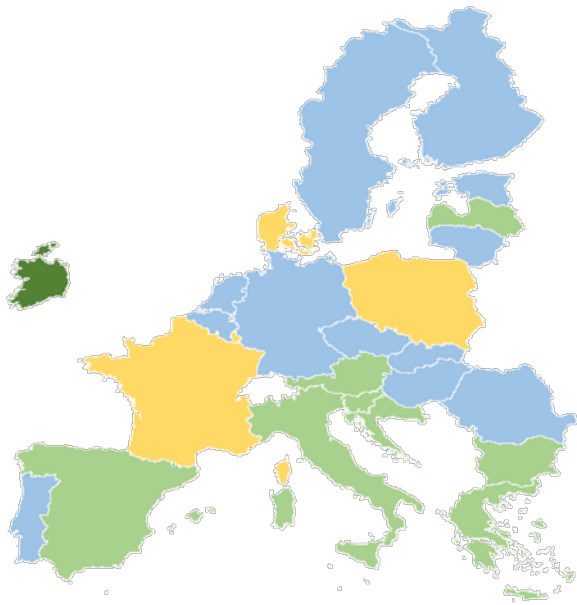


Alternative measures alone



- The scheme started 2017
- The first period will last until 2020, while an energy efficiency target has been appointed equal to 333 ktoe/10% of the total target for article 7
- The continuation of the scheme was decided within the framework of NECP
- The oil product 2017 – 2019 (59% share)
- Electricity and natural gas companies are 35% and 6%
- The highest portion of the achieved energy savings has been delivered in transport sector 60% share

Case study – Ireland (EEOS)



EEOS alone



EEOS + alternative measures



Alternative measures alone



- The Irish obligation scheme started in January 2016
- For 2017, the target was new annual primary energy equivalent (PRR) savings of 625 GWh/a with sub-targets of 20% for the residential sector and 5% for the “fuel poverty” scope
- Around 50 standardised actions for the residential sector.
- Actions in other sectors are considered on a case-by-case basis
- Ops must have in place an agreement with final customers prior to any energy savings being realised

Case study – Germany (Alternative measure)



Competitive funding programme “Energy efficiency and process-heating from renewable energies in business – competition”

- The programme refers to CO₂ emission reductions (instead of only electricity savings) and is open for all types of energy carriers saved (heat, electricity, etc.)
- Projects eligible for funding are selected according to the cost-benefit ratio (EUR funding per tCO₂ saved)
- Up to 50% of the eligible costs of the project will be funded through a non-refundable grant
- Eligible applicants are private and municipal companies, freelancers and contractors
- Eligible measures are highly efficient technologies and measures to increase the share of renewable energies for the provision of process heat

Case study – Hungary (Alternative measure)



Corporate tax relief for energy efficiency investments in industry

- Introduced in 2017
- The tax incentive can be up to 30% of eligible costs, but not more than the HUF equivalent of EUR 15 million
- The tax incentive may only be claimed in connection with projects aimed at EE improvement

Residential sector – green investment system and green economy financing scheme

Services sector and industry – corporate tax relief

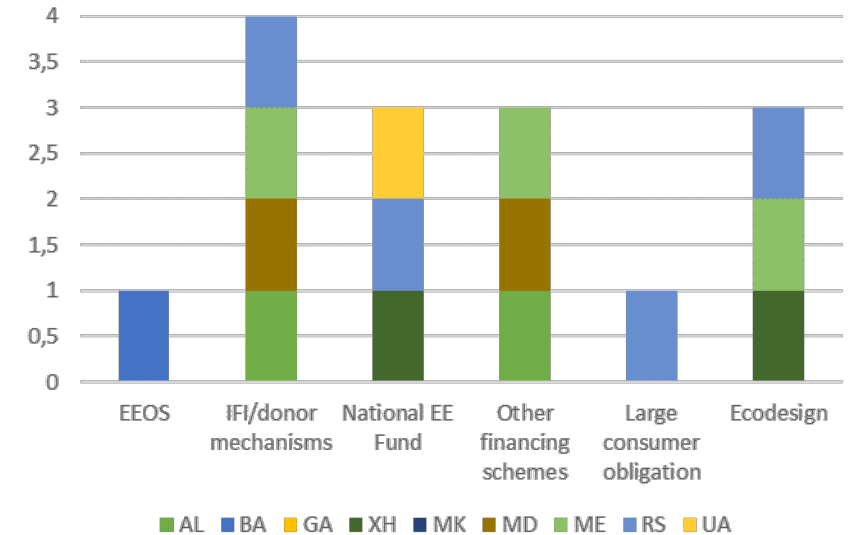
Transport – CO₂ quotas for e-mobility

Energy Community countries experience

- 2020 Article 7 targets for Contracting Parties were a scaled back version of EU Member States
- Cumulative target for 2017-2020
 - New savings equivalent to 0.7%/annum of reference quantity (2013-2015)
 - Cumulative savings of 7% by 2020 prior to allowed reductions
- Member States were to Notify ECS by 15 October 2017 (Only Serbia (17 Jan 2020) sent a formal Notification)
- Cumulative target for 2021-2030
 - To be confirmed
 - 10-year period rather than 4-year period
 - Could be significantly more onerous
 - EU target on new savings equivalent to 0.8%/annum of reference quantity (2016-2018) would mean > doubling ambition for CPs

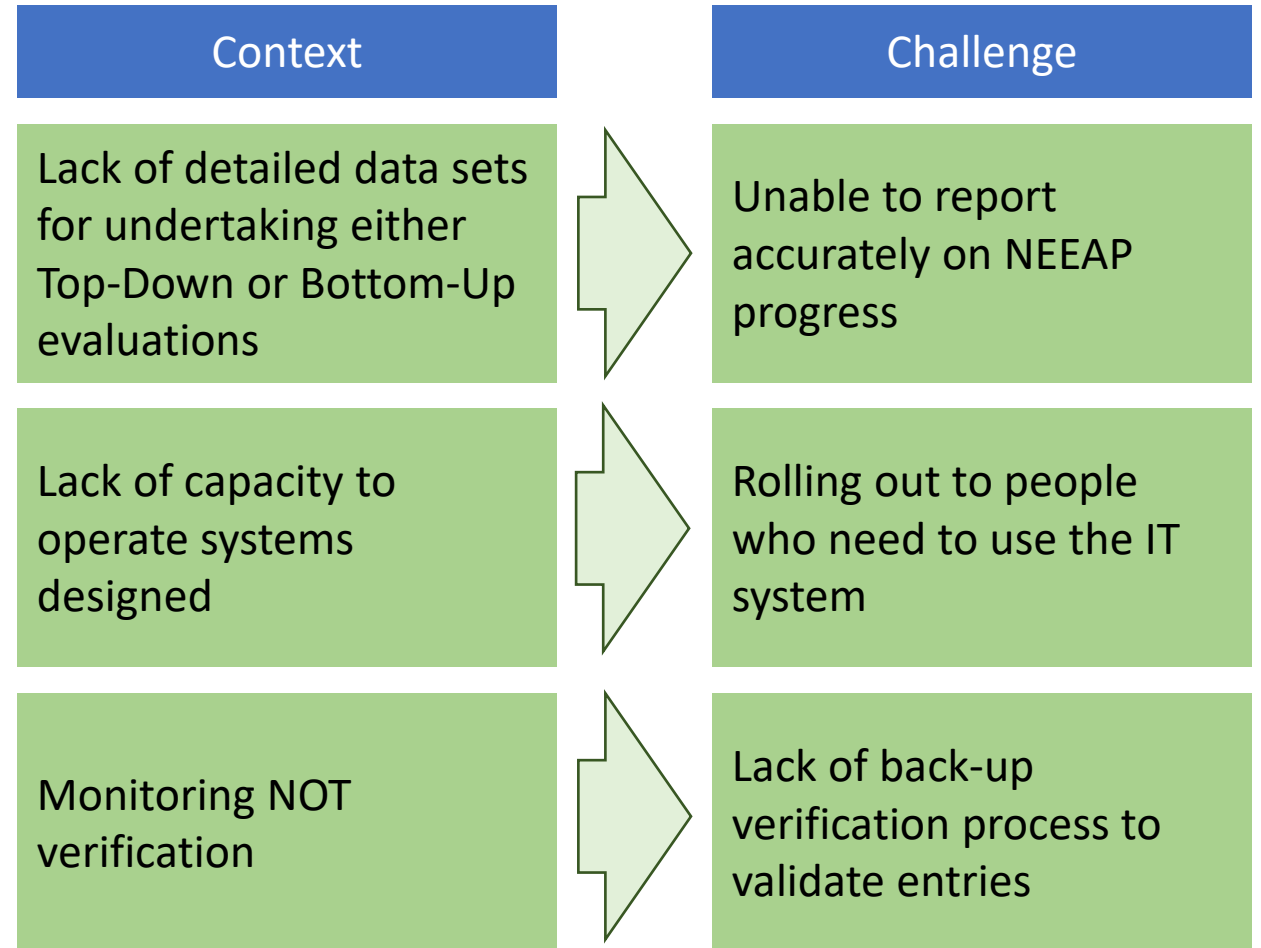
Notified or indicated measures have focused on funds and financing schemes

- EEOS considered in number of CPs but only committed to in BA
- Donor and IFI mechanism represent most pre-existing policies
- National EE Fund established, planned or under consideration in almost all CPs
- These have had a public sector focus
- Other financing schemes are mix of municipality schemes and measure-specific grants
- Ecodesign is not a requirement for CPs and thus eligible
- Options remain open from primary legislation in some CPs



Lack of robust monitoring, verification and reporting for existing policies to evidence compliance

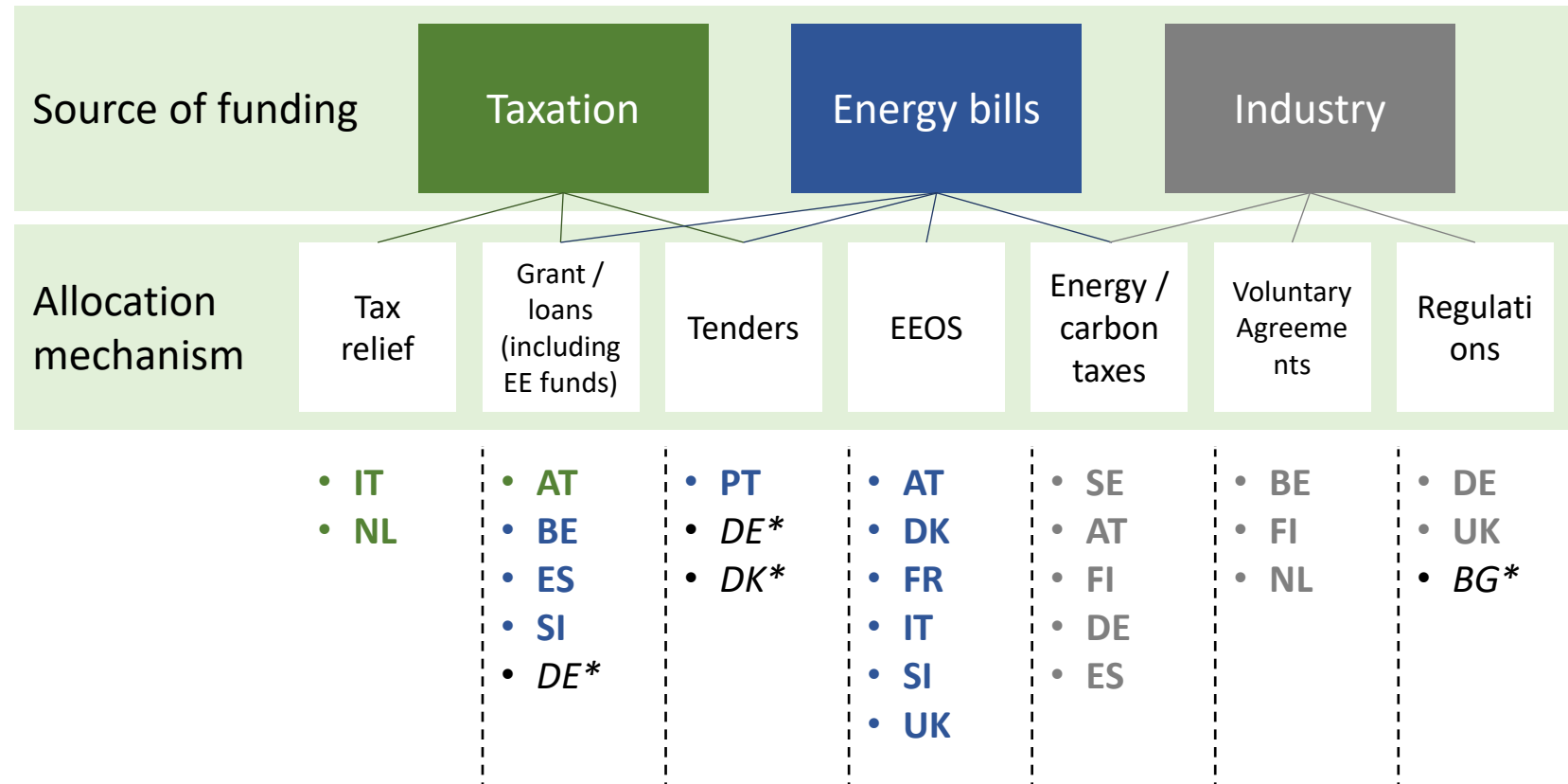
- Data sets regarding energy savings from existing policies are often disaggregated and have incomplete information
- Calculation methodologies used to derive estimated savings may be inconsistent or not compliant with Article 7
- Requirements for Article 7 not considered in measure design and so processes for M&V are insufficient for compliance purposes



Contracting Parties have a weak base of pre-existing policies

Notified measures contributing >15% of A7 target in EU Member States

- Many EU MSs used existing schemes for Article 7
- Among major contributing measures for EU only financing mechanisms and regulations common in CPs
- Financing mechanisms are largely donor dependent due to budget constraints
- Only RS (for Fund) and BA (for EEOS) leverage energy bills
- Ecodesign puts cost onto industry



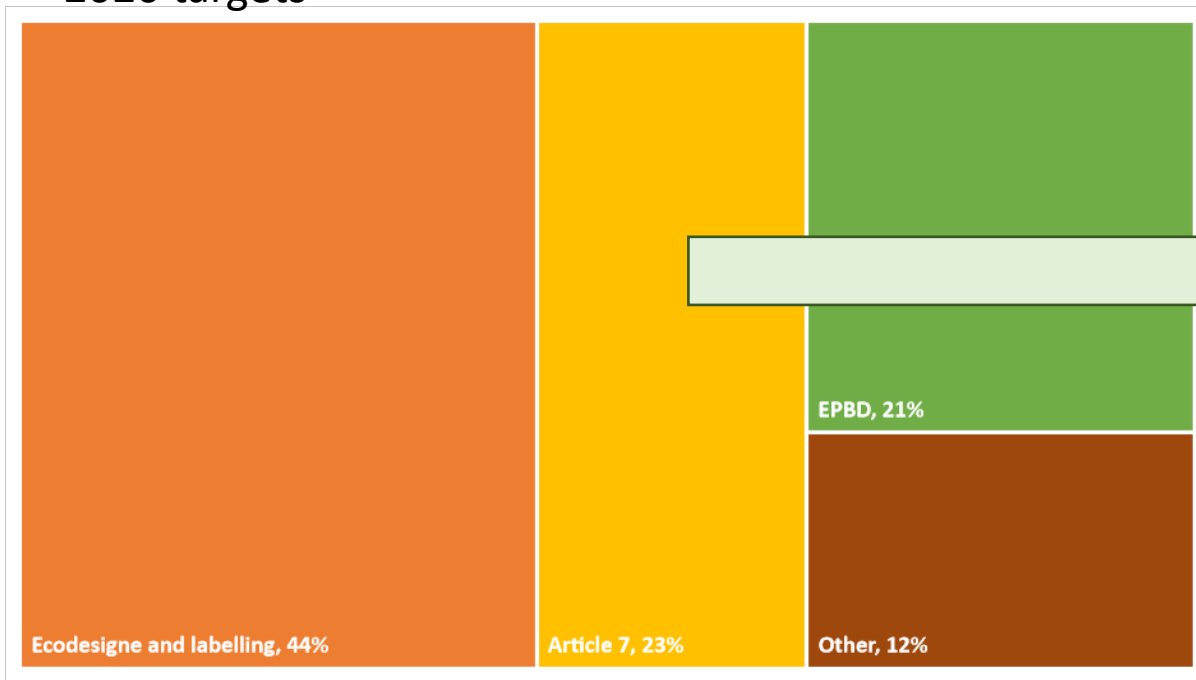
* KfW grant and loan schemes only provide 11% of Germany's Article 7 target – included for interest

* German tender mechanism only a pilot (not contributing to Article 7 for 2020), Danish still in planning – both included due to potential importance 2021-2030

* Bulgaria only included for relevant of previous target user obligation scheme

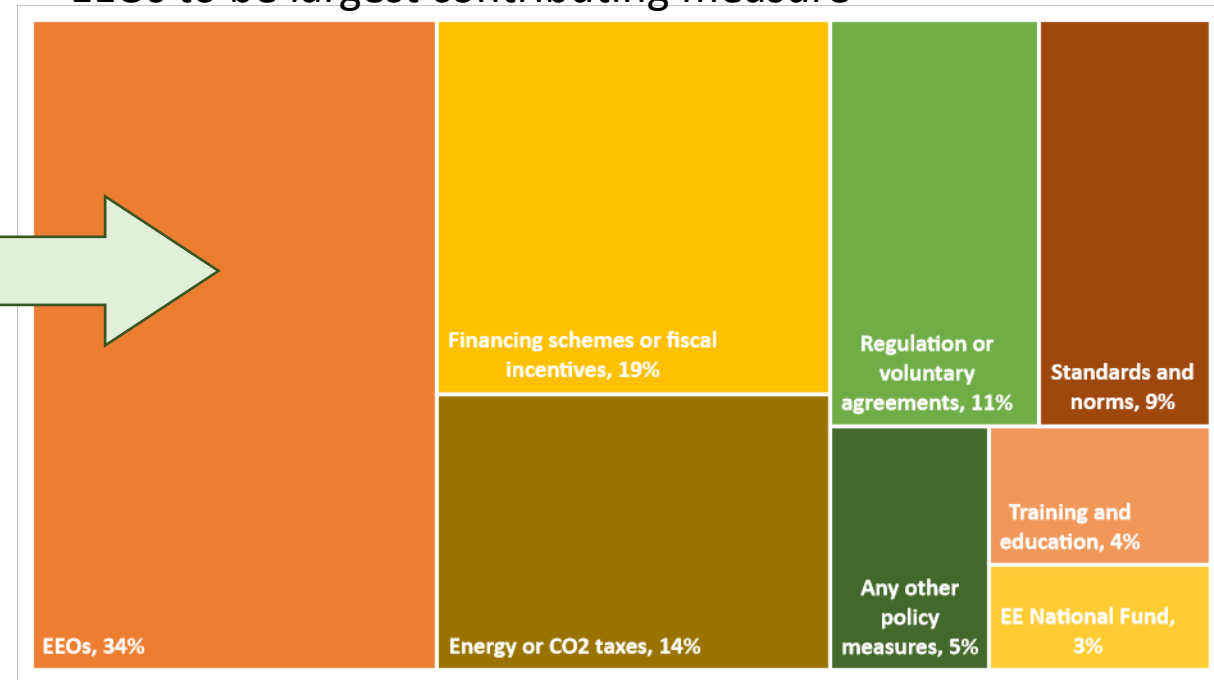
Lack of commitment to EEOs or energy/carbon taxes creates a hole – Ecodesign may partially fill unless made mandatory

EU estimated energy savings contributions to 2020 targets



Source: European Commission (2016) Impact Assessment: Proposal for a Directive of the European Parliament and of the Council amending Directive 2012/27/EU on Energy Efficiency”

EU Member States Article 7 Notification expect EEOs to be largest contributing measure



Source: European Parliamentary Research Service (2016) “Implementation of the Energy Efficiency Directive (2012/27/EU): Energy Efficiency Obligation Schemes”

CPs have a largely “blank slate” for policy mix to meet targets

- Key questions:
 - Where is greatest untapped EE opportunity?
 - What policy package can:
 - Address identified market features that prevent opportunity being exploited?
 - Is internally cohesive?
 - Is affordable?
 - Can elicit political support?
 - EE Funds are popular due to centralization, donor support, and public sector focus
 - Ecodesign is popular due to simplicity, allocation of costs to industry, and impact
 - But more is needed – what are most promising options?

Calculate expected contribution of existing Alternative Measures – assess plan and target for 2020/2030



Look at long-term objective (2030), is an EEO desirable?



Main alternative options / transitional measures:

1. Use centralised EE Fund (may still need 18 months+), funded via:
 - a) Government budget / donor and IFI support
 - b) Levy on energy tariffs (can transition into a future EED scheme)
2. Place an energy saving obligation on large and users and/or voluntary agreements
3. Additional regulations above and beyond Energy Community minimum standards (e.g. Ecodesign)

Interest has focused on potential for EEOS and “big ticket” Alternative Measures

EEOS

- Significant interest from CPs
- Primary legislation for many allows for EEOS
- Major constraints are:
 - Perceived cost – energy tariff increases are politically difficult
 - Capacity – complexity of setting up and operating scheme seen as onerous
 - Compliance – push back from utilities not familiar with EE
- Initial interest has become stuck at point political decision is needed

Ecodesign

- Provides significant savings potential
- Energy Labelling already a requirement – complementary with Ecodesign
- Regulations only require some local tailoring
- But may become mandatory for CPs – ineligible for Article 7
- CPs also need training on market surveillance requirements

EE Funds

- Operational, planned or proposed in almost all CPs
- Funded by mix of government budget, donors, and energy bill levies (Serbia only – not strictly hypothecated)
- Most funds have initial focus on public sector (municipality projects) but ambition to expand residential offering
- Constrained by ability to scale given budgets
- Best practice governance arrangements are vital

Alternative options – Tenders, taxation measures and large consumer obligations

Tenders

- Portuguese or Swiss model
- May help overcome utility opposition
- Gives greater control over funding which could help with political acceptance
- Can ensure good distribution of funding
- Region becoming familiar with RES auction model
- But funding source remains problematic

Taxation measures

- Tax breaks are more popular than levies!
- Can achieve scale (see Dutch and Italian cases)
- Can encourage grey economy into tax system
- Can target specific technologies
- Concerns regarding genuine additionality
- Can be complex to avail and regressive in application (dependent on having tax bill to offset)

Large consumer obligations

- Placed on large consumers leveraged Article 8 audit requirement
- Examples include previous schemes in Bulgaria and Serbia
- Can act together with EE Fund
- But focuses on area where market failures are arguably smallest

Roadmap for 2030 success

- 2030 Article 7 targets for CPs will need new policy measures that can deliver at scale
- EEOS remain a prominent option and under consideration in many CPs
- Gaining broad buy-in takes time (see elsewhere in South-East Europe)
- Continued engagement of utilities and regulator in EE programmes helps lay groundwork
- Must be realistic on scope and targets
- Strong M&V platform is necessary either EEOS or Alternatives

- EE Funds have increased in popularity but have limitations, including in scale – scope for innovation in financing approach (e.g. on-bill approaches or PACE loans)
- Ecodesign may contribute strongly in near-term but could become mandatory and thus ineligible
- Tenders may offer a workable alternative to an EEOS given adequate funding

Case study - Croatia

- Targets and legal framework for article 7 EED in Croatia
 - NEEAP targets for article 7 in period 2014-2020
 - Law on energy efficiency
 - Regulation on EEOS
 - Regulation on Monitoring and Verification
- Impacts of alternative measures in period 2014-2019 (2020)
- Insight in period 2021-2030
 - NECP targets and measures
- Lessons learned

NEEAP targets for article 7 for the period 2014-2020

	Annual savings [PJ]	Cumulative savings [PJ]	Reduction of cumulative savings
Saving as per article 7 (1) EED	2,583	71,333	-
Application of article 7 (3) EED	1,938	54,250	25%

	Target							
Annual saving [PJ]	1,5%	1,5%	1,5%	1,5%	1,5%	1,5%	1,5%	TOTAL
2014	1,938							1,938
2015	1,938	1,938						3,875
2016	1,938	1,938	1,938					5,813
2017	1,938	1,938	1,938	1,938				7,750
2018	1,938	1,938	1,938	1,938	1,938			9,688
2019	1,938	1,938	1,938	1,938	1,938	1,938		11,625
2020	1,938	1,938	1,938	1,938	1,938	1,938	1,938	13,563
CUMULATIVE								54,250
ANNUAL								1,938

NEEAP: Target to be achieved with combination of alternative measured (50,1%) and EEOS (49,9%)

Legal framework for article 7 EED in Croatia

Law on EE

- Targets are defined in NEEAP
- AM defined in NEEAP
- EEOS for energy suppliers (electricity, gas, heat, oil products) – gradual introduction (300-100-50 GWh threshold)

Regulation of EEOS

- Accounting of energy savings, trading and transfer of energy savings
- Annual reporting of achieved savings
- Payment of penalty fee for underachievement

Regulation on M&V

- Obligatory use of MVP (SMIV) for subsidy provider, obliged parties, public sector and ESCOs
- BU methods for calculation of energy savings for 33 measures

Impact of alternative measures 2014-2019(20)

Alternative measures from 4. NEEAP	Year / Savings [PJ]							CUM	CUM
	2014	2015	2016	2017	2018	2019	2020	14-19	14-20
Energy renovation of SFH									
EE Fund 2014-2016	0,0230	0,2704	0,2877	0,1379				3,0545	3,7735
EE Fund 2017-2020						0,0143	0,0066	0,0143	0,0352
Energy renovation of MAB								-	-
EE Fund 2014-2016	-	0,0706	0,0633	0,1548	0,0017			1,0740	1,3644
ESIF OPCC					0,1086	0,3190	0,0157	0,5362	0,9795
Individual heat metering								-	-
EE Fund 2014-2016	0,0210	0,1649	0,1192					0,5681	0,5681
Energy poverty reduction								-	-
								-	-
Energy renovation of public buildings								-	-
EE Fund 2014-2016	-	0,0879	0,0234	0,0404				-	-
EE Fund 2017-2020					0,0001			0,0002	0,0003
ESCO 2014-2015	-	0,0342	0,0293	0,0715	0,0946	0,0026		0,6945	0,9267
ESIF OPCC				0,0211	0,0301	0,1720	0,0257	0,2955	0,5444
Energy renovation of commercial buildings								-	-
EE Fund 2014-2016	-	0,0273	0,0133	0,0097	0,0007			0,2202	0,2712
EE Fund 2017-2020								-	-
ESIF OPCC						0,0006	0,0035	0,0006	0,0047
Energy renovation of public lighting								-	-
EE Fund 2014-2016	0,0400	0,0204	0,0138					0,3972	0,4714
ESCO		0,0006	0,0026	0,0169	0,0100	0,0269	0,0033	0,1110	0,1713
Local authorities			0,0003	0,0012				0,0048	0,0063
ESIF credit line								-	-
EE in manufacturing industry								-	-
EE Fund 2014-2016	-	0,0262	0,0301	0,0750				0,4764	0,6077
ESIF OPCC						0,0288	0,0099	0,0288	0,0675
Energy efficient vehicles								-	-
EE Fund 2014-2016	0,0050	0,0074	0,0035					0,0810	0,0969
EE Fund 2017-2020					0,0036	0,0285		0,0357	0,0678
Eco driving trainings								-	-
EE Fund 2014-2016	0,0170	0,0176	0,0007	0,0008				0,0723	0,0723
Other measures in transport								-	-
Special tax on motor vehicles								-	-
City bikes systems								-	-
	0,1060	0,7275	0,5872	0,5293	0,2494	0,5927	0,0647	7,67	10,03

Impacts of alternative measures 2014-2019(20)

- 14.944 projects in SMIV (MVP) (as of 15.6.2020)
- Achievements until now:
 - Less than 40% of AM target
 - Less than 20% of total target

Cumulative target 2014-2020 [PJ]	54,2500
Cumulative target for alternative measures [PJ]	27,1830
Cumulative savings until 15.6.2020 [PJ]	10,0300
Share in total target [%]	18,49%
Share in target for alternative measures [%]	36,90%

Impacts of alternative measures 2014-2019(20)

- Even with significant co-financing in period 2014-2020, alternative measures did not deliver all envisaged savings
 - > 220 M€ from EE Fund
 - > 411 M€ from ESIF
- Open issues: savings from EMIS in public sector (additionality request by EC)
 - According to NEEAP, expected cumulative savings are 10,259 PJ in period 2014-2020 (0,335 PJ annually)
- M&V issues
 - SMIV (MVP) could be improved and made easier for analysis
 - Double counting
 - Discrepancies between BU methods and calculations in project design documentation (e.g. demand vs. consumption)

Experience from 1st year of EEOS

- Obligated parties – energy suppliers
 - 25 obligated parties with their affiliated companies in 2019
 - 31 obligated parties with their affiliated companies in 2020
- > 920 measures from obliged parties entered in SMIV (MVP)
 - All measures from period 2014-2019 are taken into account

	Achieved with measures in transformation	Achieved without measures in transformation	Target according to 4 th NEEAP
New savings in 2019 [PJ]	0.657	0.552	0.967
Total savings in 2019 [PJ]	5.093	0.990	5.800
Cumulative savings 2014-2019 [PJ]	19.325	3.920	20.303
Cumulative savings 2014-2020 [PJ]	24.019	4.511	26.820

Experience from 1st year of EEOS

Important issues:

- Understanding that new annual energy savings shall be achieved (lifetime of measures)
- Overlapping of AM and EEOS should not be permitted
- Trading of energy savings should be permitted and supported with transparent rules and trading platforms
- Penalties should be known in front
- Treatment of measures in transformation, transmission and distribution
- Stimulation of energy poverty related measures – 10 to 30% higher savings are accounted
- Transfer between two cumulation periods is not permitted

Insight in period 2021-2030 – NECP targets

NECP as main policy document – defines targets for EE dimension

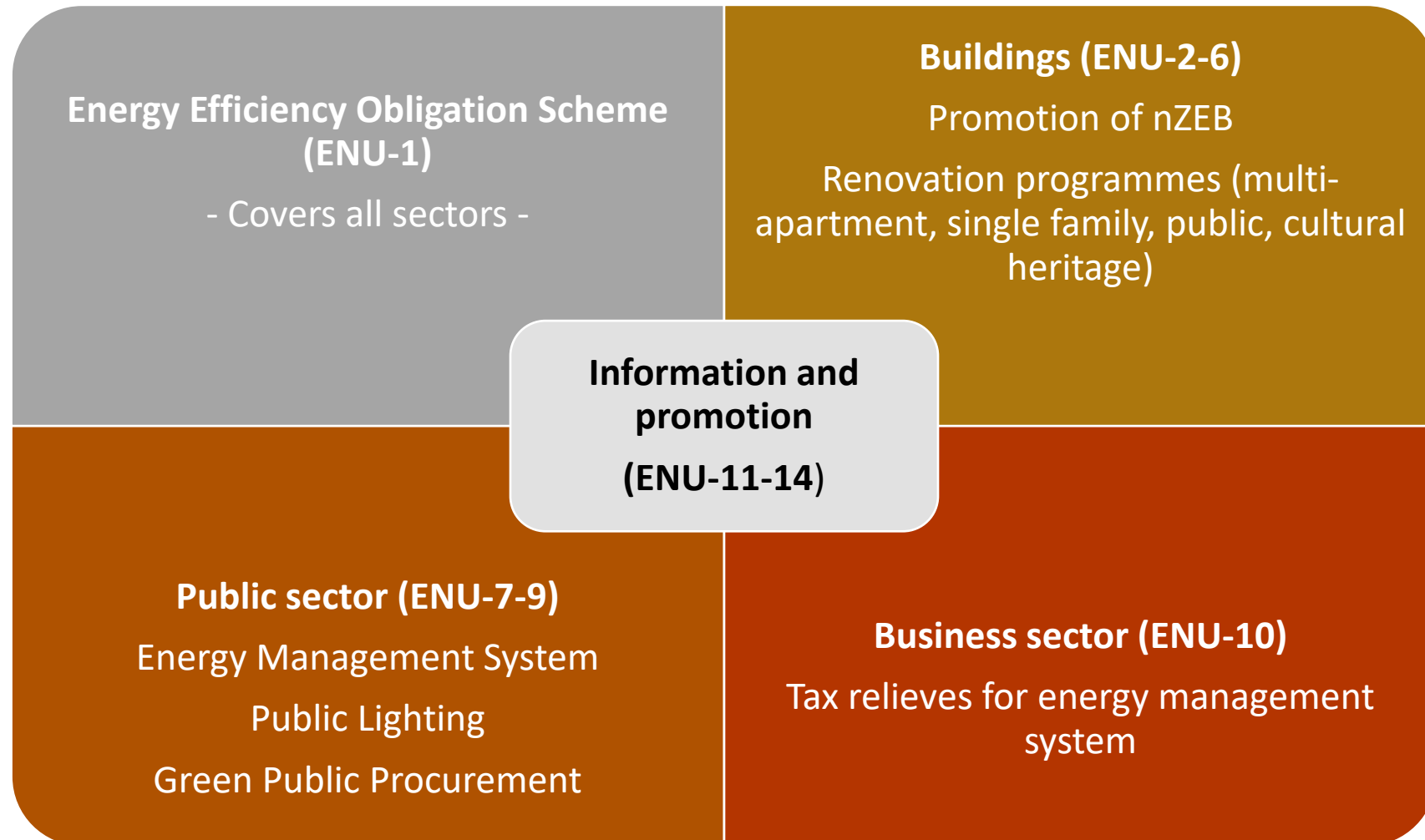
	Target 2020 (NEEAP)		Target 2030 (NECP)	
	PJ	Mten	PJ	Mten
Primary energy consumption	448.5	10.71	344.38	8.23
Final energy consumption	291.3	6.96	286.91	6.85

- Much higher article 7 targets due to methodology change (54 vs. 125 PJ)
- Amendments to Law on Energy Efficiency
 - 70% of article 7 target to be achieved by EEOS, while 30% by AM
 - AM defined in NECP

NECP measures

- 86 measures proposed
 - 34 decarbonisation – emissions
 - 12 decarbonisation – transport
 - 4 decarbonisation – renewable energy sources
 - **17 energy efficiency (14 in end-use sectors)**
 - 9 energy security
 - 5 internal energy market
 - 6 research, innovation and competitiveness
- The most important areas are:
 - In power sector: renewables (no financial support, just ETS)
 - **In buildings: NZEB renovation and construction**
 - In transport: biofuels and e-vehicles

EE measures (without transport)



Ex-ante evaluation of individual EE measures

Article 7 EED target 2030	[PJ]
Cumulative savings	125.3
Annual savings	2.3

Nr.	Measure	Evaluation method / principle	Result
ENU-1	EEOS	70% of article 7 target to be achieved by EEOS	87.7 PJ cumulative 1.600 PJ annually
ENU-3	Multi-app buildings	Deemed savings: 520.000 m2 annually	0.148 PJ annually
ENU-4	Singe-family houses	Deemed savings: 350.000 m2 annually	0.191 PJ annually
ENU-5	Public buildings	Deemed savings: 350.000 m2 annually	0.169 PJ annually
ENU-7	EMS in public sector	Engineering estimates	0.100 PJ annually
ENU-8	Public lighting	Deemed savings: 770.000 lamps	0.090 PJ annually

Achieved savings until 2019 – reality check

Alternative measures from 4. NEEAP	Year / Savings [PJ]						Average annual savings [PJ]
	2014	2015	2016	2017	2018	2019	
Energy renovation of SFH	0,0230	0,2704	0,2877	0,1379	-	0,0143	0,1222
EE Fund 2014-2016	0,0230	0,2704	0,2877	0,1379			
EE Fund 2017-2020						0,0143	
Energy renovation of MAB	-	0,0706	0,0633	0,1548	0,1103	0,3190	0,1197
EE Fund 2014-2016	-	0,0706	0,0633	0,1548	0,0017		
ESIF OPCC					0,1086	0,3190	
Energy renovation of public buildings	-	0,1221	0,0527	0,1330	0,1248	0,1746	0,1012
EE Fund 2014-2016	-	0,0879	0,0234	0,0404			
EE Fund 2017-2020					0,0001		
ESCO 2014-2015	-	0,0342	0,0293	0,0715	0,0946	0,0026	
ESIF OPCC				0,0211	0,0301	0,1720	
Energy renovation of public lighting	0,0400	0,0210	0,0167	0,0181	0,0100	0,0269	0,0221
EE Fund 2014-2016	0,0400	0,0204	0,0138				
ESCO		0,0006	0,0026	0,0169	0,0100	0,0269	
Local authorities			0,0003	0,0012			
ESIF credit line							

Nr.	Measure	Evaluation method / principle	Result
ENU-3	Multi-app buildings	Deemed savings: 520.000 m2 annually	0.148 PJ annually
ENU-4	Singe-family houses	Deemed savings: 350.000 m2 annually	0.191 PJ annually
ENU-5	Public buildings	Deemed savings: 350.000 m2 annually	0.169 PJ annually
ENU-8	Public lighting	Deemed savings: 770.000 lamps	0.090 PJ annually

Lessons learned

- Article 7 targets are very tough to achieve – but article 7 has become the single most important driver for energy savings
- EEOS compete with grant-based alternative measures
- M&V system is critical for monitoring progress
 - Upgrades in IT platforms needed to enable easy entry and analysis, remove double counting and enable transfer of savings (trading)
- Engagement of private capital (obliged parties, ESCOs, others) is needed as public sources are limited
- Replacement of subsidies with financing instruments will be challenging, especially when targeting private households

Q&As

Thank you for your attention!

Matija Vajdić