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

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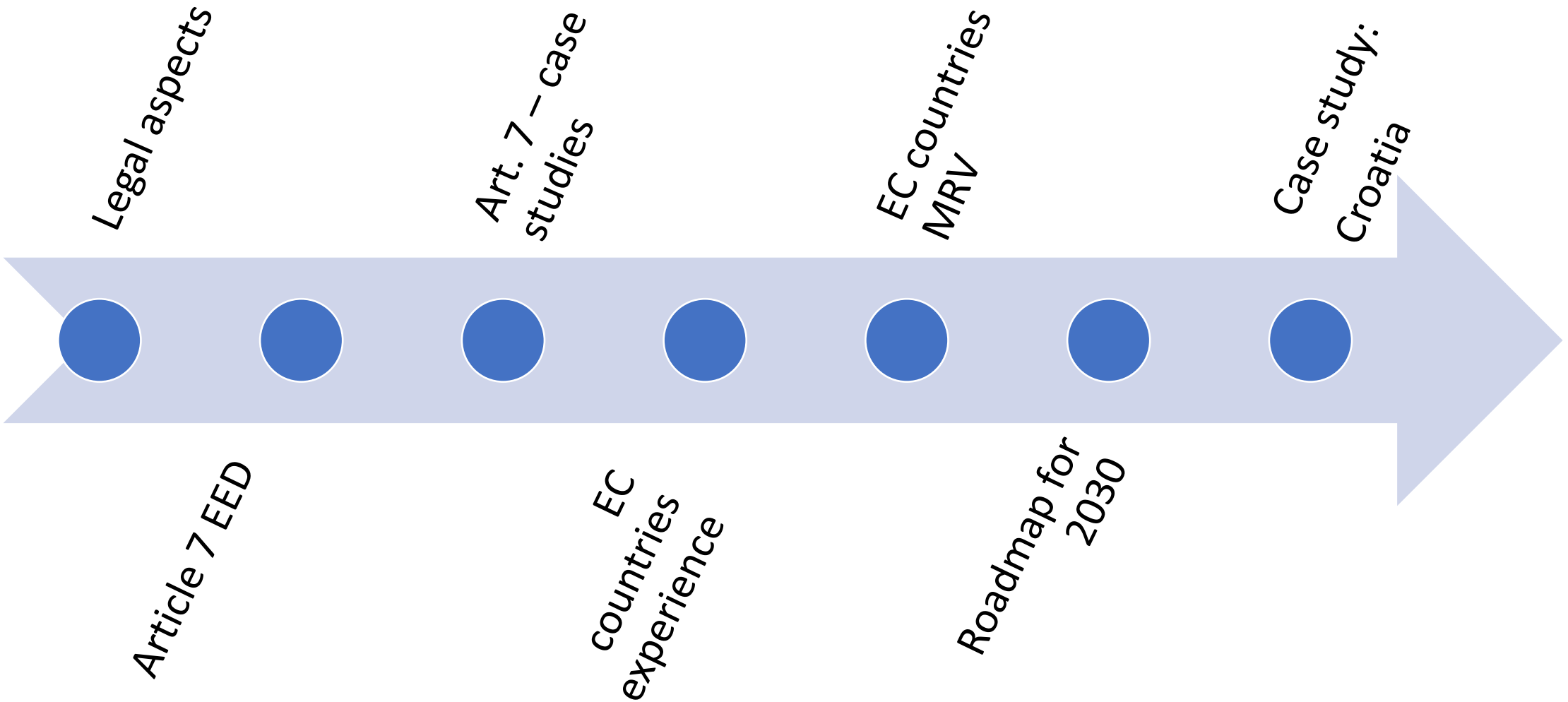


EU directives

- 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)

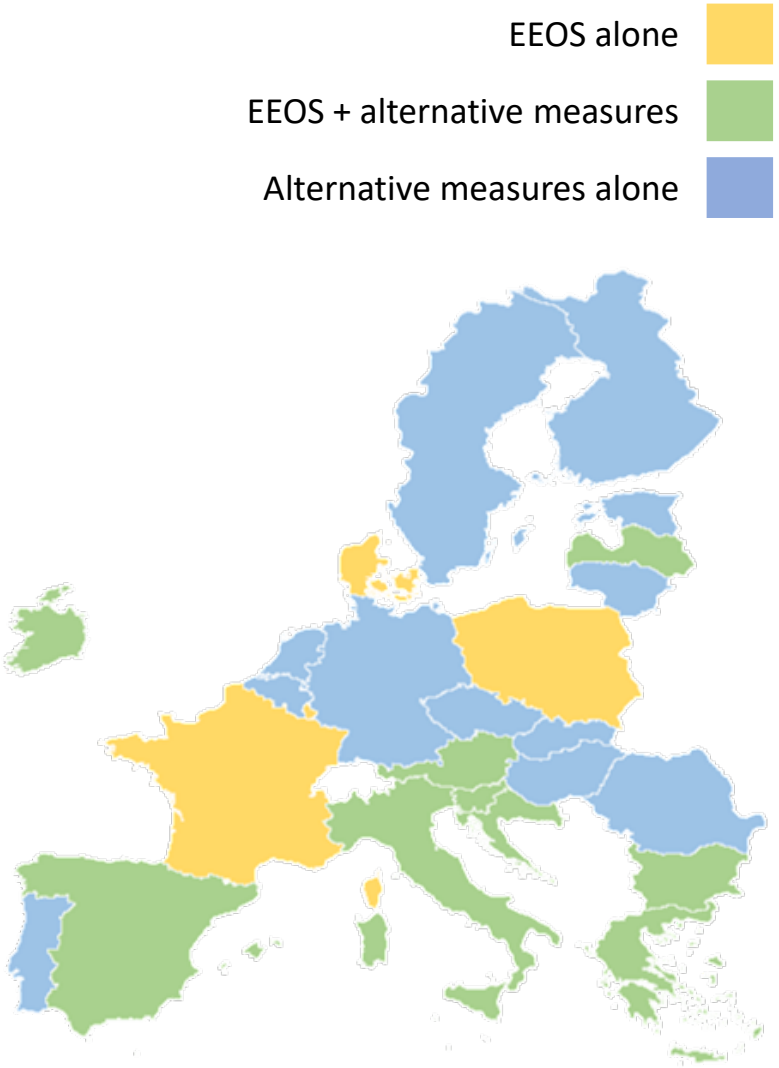
- Governance of the Energy Union and Climate Action
- Integrated national energy and climate plans
  - Decarbonisation (greenhouse gas reduction and renewables
  - Energy security
  - Energy efficiency
  - Internal energy market
  - Research, innovation and competitiveness

Article 7 EED

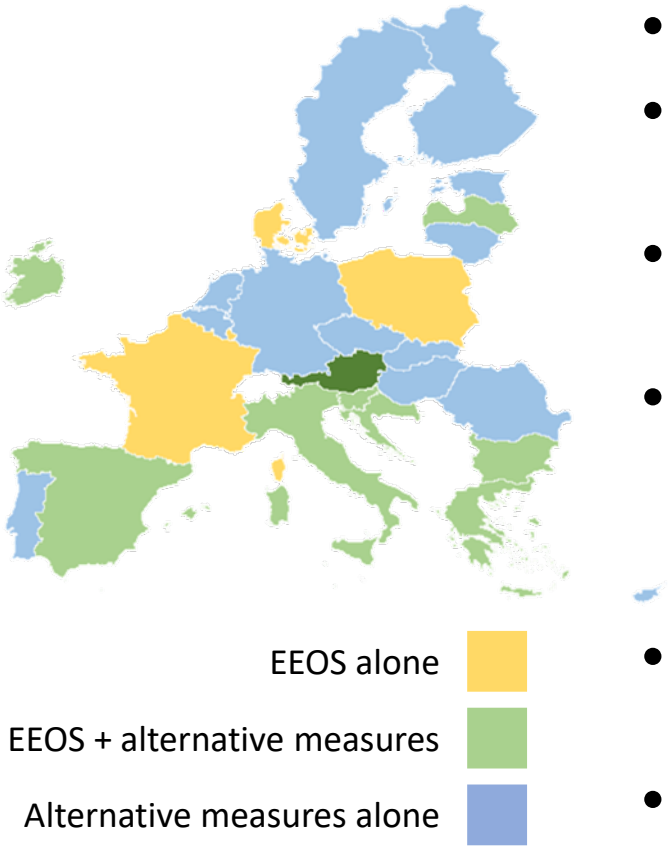
2012 Directive	2018 updates
Annual reduction of 1.5% in national energy sales 2014 – 2020	**0.8% annual final energy consumption averaged over the most recent three-year period prior to 1 January 2019**
• Principles to apply to the calculation of additionality to European Union law • Materiality of the 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	• 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 CO_2 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)

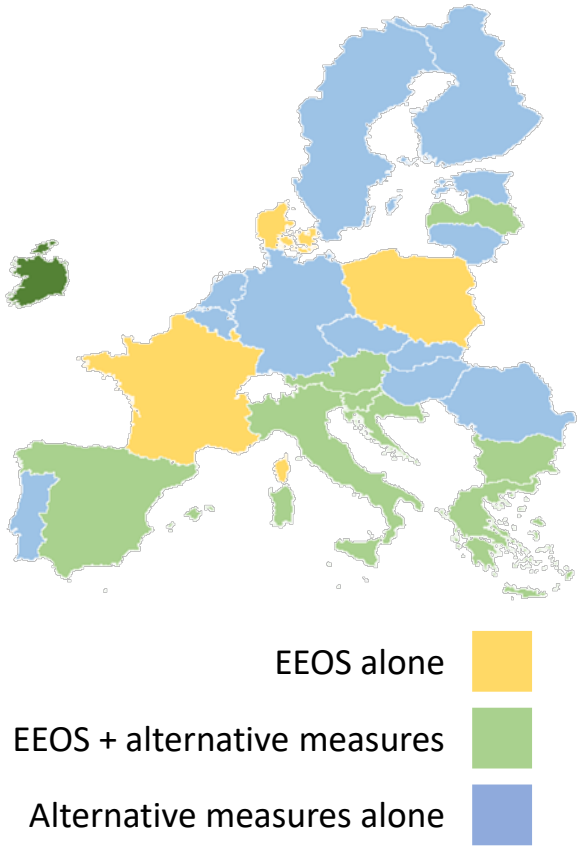


- The EEO scheme started in January 2015
- The targets are set annually as 0.6% of the reported final energy consumption
- 40% of the target has to be achieved in the household sector (housing or transport)
- The energy savings reported between 2014 and 2017 for Article 7 of the EED (from EEOs and alternative 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)

- 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)



- 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 CO_2 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

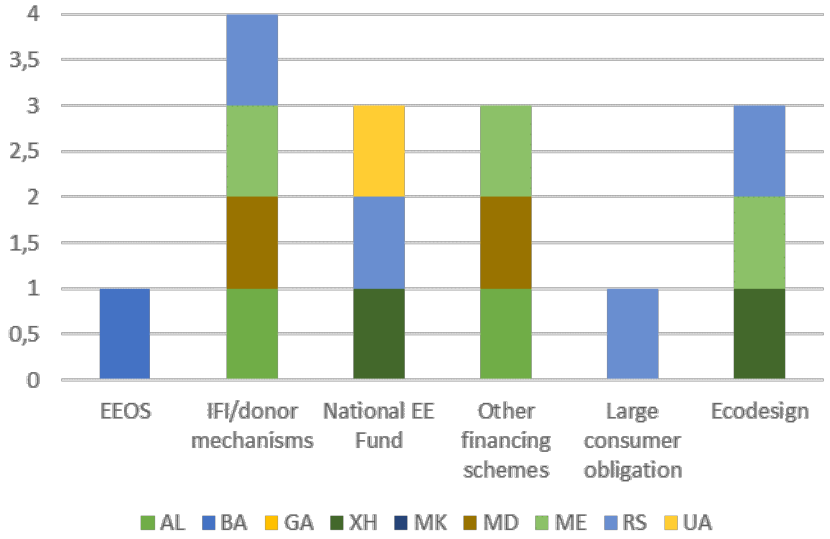
Transport – CO_2 quotas for e-mobility

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

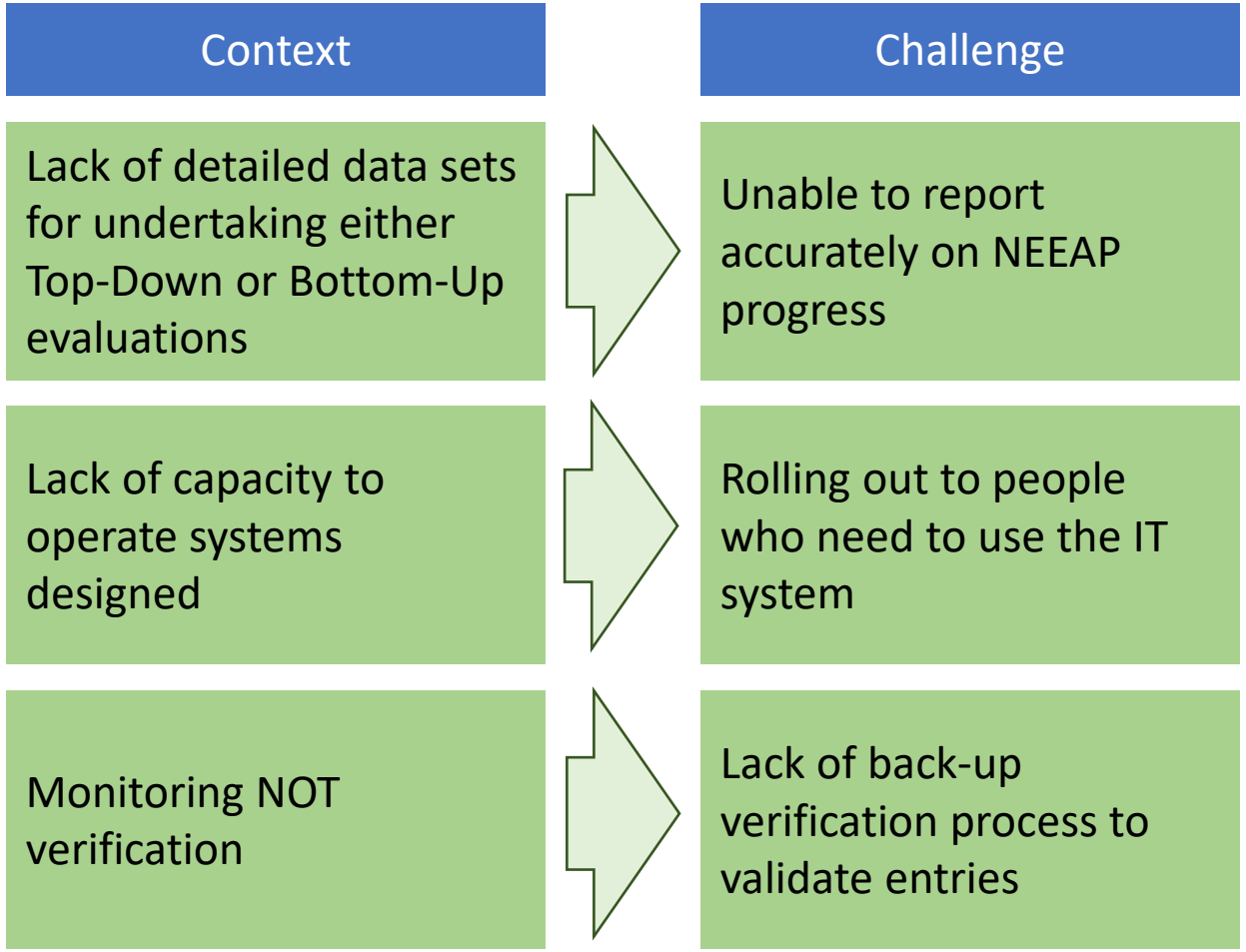
Notified or indicated measures have focused on funds and financing schemes

- 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

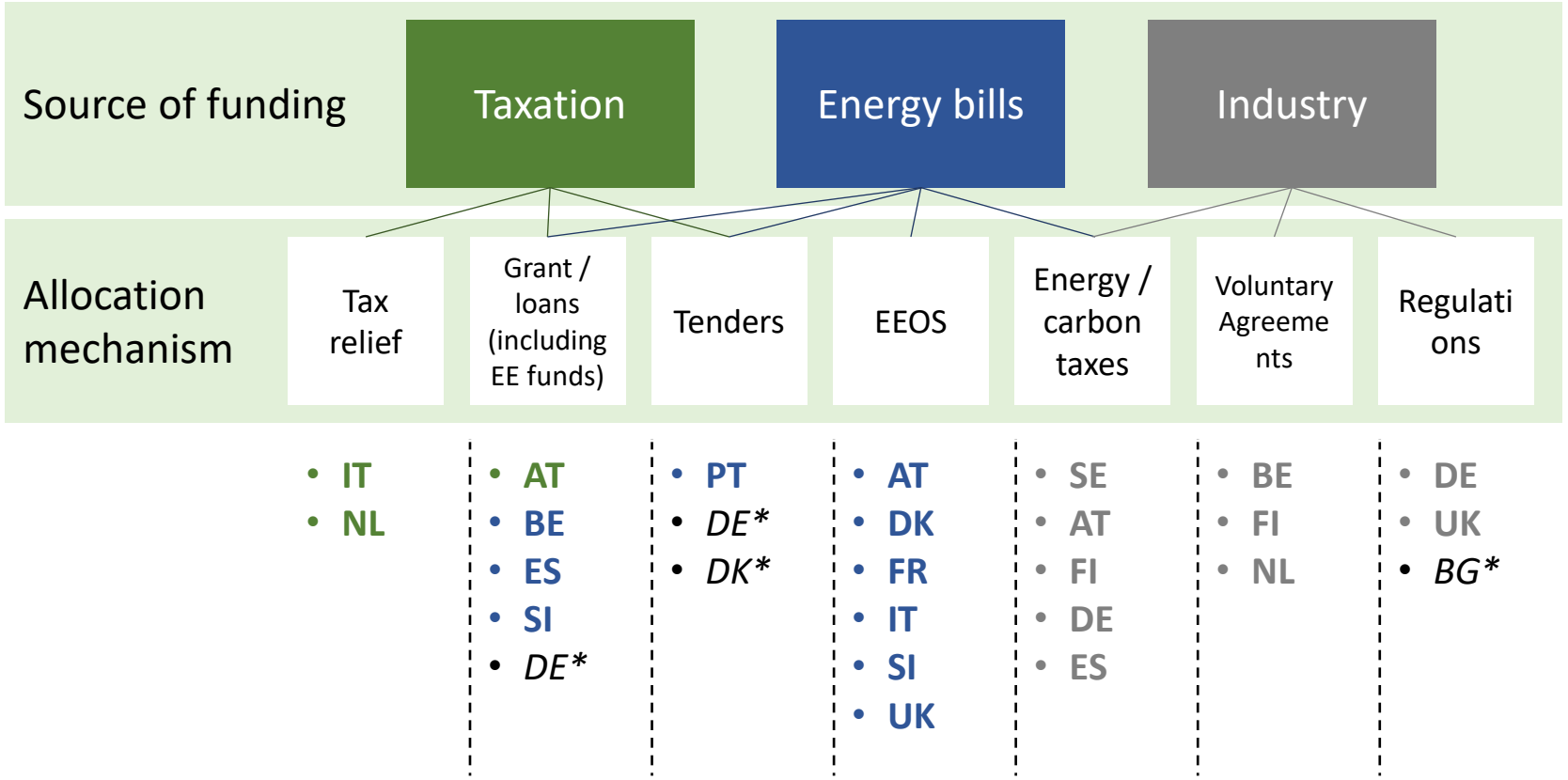
- Data sets regarding energy savings from existing policies are often disaggregated and have incomplete information
- Calculation methodologies used to derive estimated savings may be inconsistent or not compliant with Article 7
- Requirements for Article 7 not considered in measure design and so processes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



Contracting Parties have a weak base of pre-existing policies

- 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

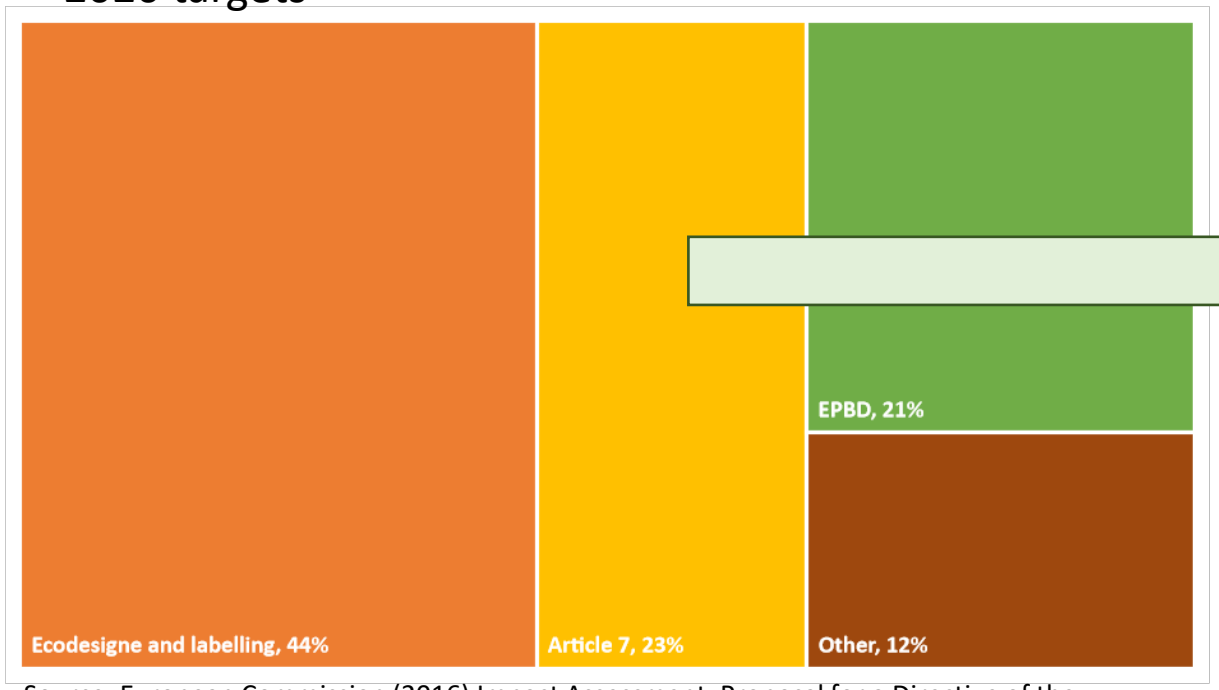
Notified measures contributing >15% of A7 target in EU Member States



* 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

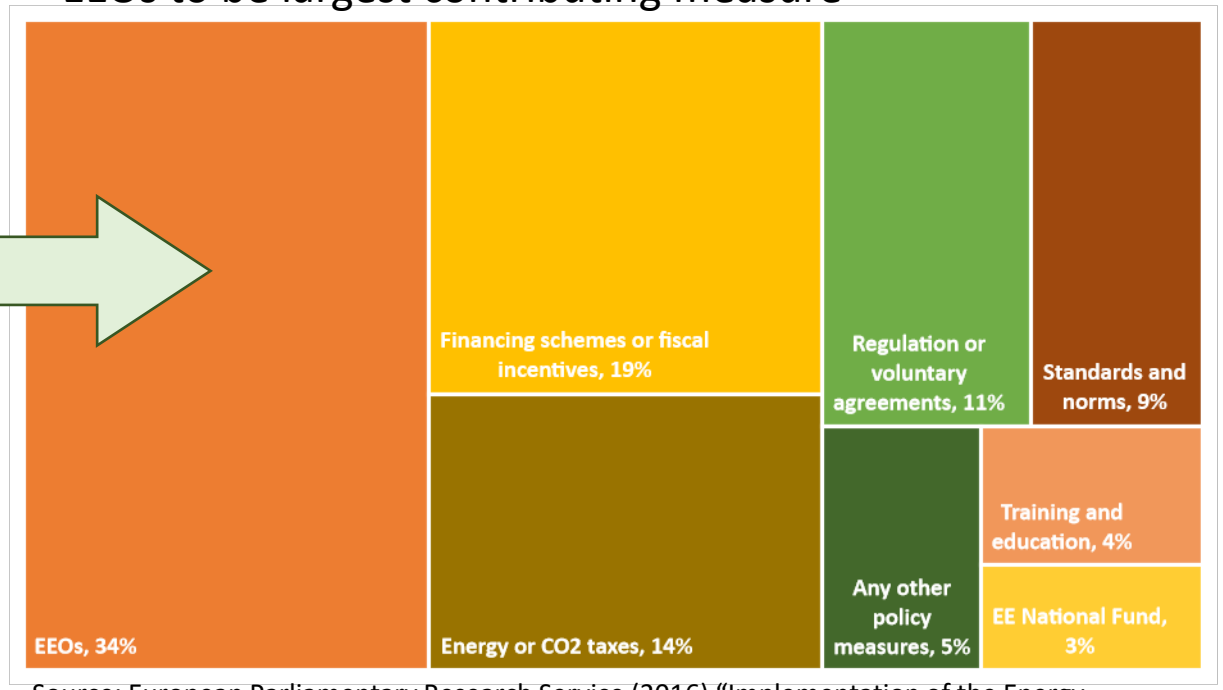
Lack of commitment to EEOS or energy/carbon taxes creates a hole – Ecodesign may partially fill unless made mandatory

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 / transitionary 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 smalles

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 4th 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

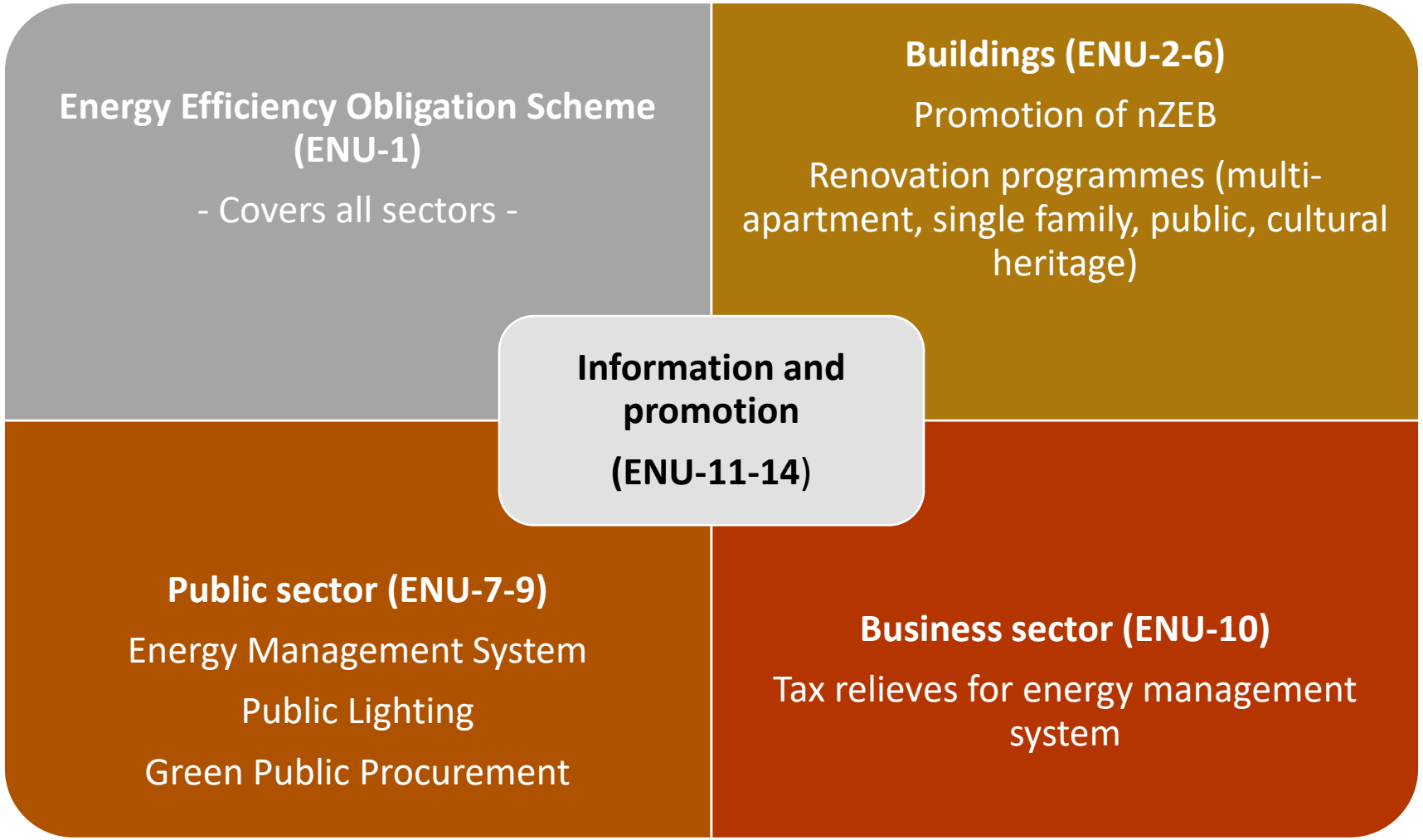
	Target 2020 (NEEAP)		Target 2030 (NECP)	
	PJ	Mten	PJ	Mten
Primary energy consumption	448.5	10.71	344.38	8.23
Final energy consumption	291.3	6.96	286.91	6.85

- 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
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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