

**NOTIFICATION OF MEMBER STATES' MEASURES AND METHODS FOR  
IMPLEMENTING ARTICLE 7 OF DIRECTIVE 2012/27/EU [AS AMENDED IN  
ACCORDANCE WITH PROPOSAL COM(2016) 761]**

The Republic of Croatia, in line with item 5 of Annex V to Directive 2012/27/EU, notifies the Commission on the proposed methodology for the operation of the energy efficiency obligations scheme and on alternative policy measures under Articles 7a and 7b, and Article 20, paragraph 6 of this Directive.

**1. The calculation of the level of prescribed energy savings to be achieved over whole period from 1st January 2021 to 31st December 2030, showing how the following elements are taken into consideration:**

*(a) the annual final energy consumption according to the average value for the last three years before January 1st 2019 [in ktoe]*

The last year for which the energy balance for Croatia is available is 2017. so the calculation is based on data for 2015., 2016. i 2017., according to the EUROSTAT method.

|  | <b>2015.</b>   | <b>2016.</b> | <b>2017.</b> |
|--|----------------|--------------|--------------|
| <b>FINAL ENERGY CONSUMPTION [ktoe]</b> | 6.574,7        | 6.636,0      | 6.924,0      |
| <b>Industry</b>                        | 1.085,4        | 1.084,9      | 1.178,3      |
| <b>Transport</b>                       | 2.106,7        | 2.162,2      | 2.336,9      |
| <b>Households</b>                      | 2.411,4        | 2.392,5      | 2.377,1      |
| <b>Services</b>                        | 740,9          | 761,9        | 801,1        |
| <b>Agriculture</b>                     | 203,3          | 206,7        | 204,9        |
| <b>Civil engineering</b>               | 27,0           | 26,8         | 25,7         |
| <b>AVERAGE [ktoe]</b>                  | <b>6.711,6</b> |              |              |

*(b) cumulative amount of energy savings to be achieved in the period from 1st January 2021 until 31st December 2030 (according to the Article 7 paragraph 1 b) of the Directive 2012/27/EU) [in ktoe]*

| <b>Basis for target calculation (a)-(b)-(c) [ktoe]</b>           |      |      |      |      |      |      |      |      |      |      | <b>6.711,6</b> |
|--|------|------|------|------|------|------|------|------|------|------|----------------|
| <b>Annual savings [ktoe]</b>                                     | 0,8% | 0,8% | 0,8% | 0,8% | 0,8% | 0,8% | 0,8% | 0,8% | 0,8% | 0,8% |                |
| <b>2021</b>  | 53,7 |      |      |      |      |      |      |      |      |      | 53,7           |
| <b>2022</b>  | 53,7 | 53,7 |      |      |      |      |      |      |      |      | 107,4          |
| <b>2023</b>  | 53,7 | 53,7 | 53,7 |      |      |      |      |      |      |      | 161,1          |
| <b>2024</b>  | 53,7 | 53,7 | 53,7 | 53,7 |      |      |      |      |      |      | 214,8          |
| <b>2025</b>  | 53,7 | 53,7 | 53,7 | 53,7 | 53,7 |      |      |      |      |      | 268,5          |
| <b>2026</b>  | 53,7 | 53,7 | 53,7 | 53,7 | 53,7 | 53,7 |      |      |      |      | 322,2          |
| <b>2027</b>  | 53,7 | 53,7 | 53,7 | 53,7 | 53,7 | 53,7 | 53,7 |      |      |      | 375,8          |
| <b>2028</b>  | 53,7 | 53,7 | 53,7 | 53,7 | 53,7 | 53,7 | 53,7 | 53,7 |      |      | 429,5          |
| <b>2029</b>  | 53,7 | 53,7 | 53,7 | 53,7 | 53,7 | 53,7 | 53,7 | 53,7 | 53,7 |      | 483,2          |
| <b>2030</b>  | 53,7 | 53,7 | 53,7 | 53,7 | 53,7 | 53,7 | 53,7 | 53,7 | 53,7 | 53,7 | 536,9          |
| <b>TOTAL CUMULATIVE TARGET FOR THE PERIOD 2021 – 2030 [ktoe]</b> |      |      |      |      |      |      |      |      |      |      | <b>2.953,1</b> |
| <b>TOTAL CUMULATIVE TARGET FOR THE PERIOD 2021 – 2030 [PJ]</b>   |      |      |      |      |      |      |      |      |      |      | <b>123,6</b>   |
| <b>Annual savings [PJ]</b>                                       |      |      |      |      |      |      |      |      |      |      | <b>2,2</b>     |

(c) sources used in the calculation of final energy consumption, including justification for the use of alternative statistical sources (if sources other than Eurostat were used)

The above data are taken from the annual energy reports "Energy in Croatia" for the years 2015 and 2016 and 2017. The reports include, inter alia, energy balances produced according to the EUROSTAT methodology. All reports are available on the Ministry of the Environment and Energy's website: <https://mzoe.hr/hr/energetika/energetska-politika-i-planiranje.html>

**2. Member States which decide to use any of the options referred to in Article 7 (2) of Directive 2012/27 / EU shall report on their calculation of the energy savings level over the whole period from 1st of January 2021 to 31st of December 2030, showing that the following elements have been taken into account:**

(a) annual savings rate

An annual savings rate of 0,8% shall apply, in accordance with Article 7 (1) (b).

(b) amount of sold energy used in transport, excluded from the calculation [in ktoe]

The Republic of Croatia excludes from the baseline the total final energy consumption in transport for the calculation of the target .

|  | 2015.   | 2016.   | 2017.          |
|--|---------|---------|----------------|
| Transport  | 2.106,7 | 2.162,2 | 2.336,9        |
| <b>AVERAGE [ktoe]</b>                                |         |         | <b>2.201,9</b> |
| <b>New baseline for calculation of target [ktoe]</b> |         |         | <b>4.509,7</b> |

(c) cumulative amount of energy savings for the period from 1st January 2021 until 31st December 2030 (before possibility in Article 7 paragraph 4 points b) to g) of the Directive 2012/27/EU was applied) [in ktoe]

| Basis for target calculation 1.(b) – 2.(b) [ktoe]                |      |      |      |      |      |      |      |      |      |      | 4.509,7        |
|--|------|------|------|------|------|------|------|------|------|------|----------------|
| Annual savings [ktoe]  | 0,8% | 0,8% | 0,8% | 0,8% | 0,8% | 0,8% | 0,8% | 0,8% | 0,8% | 0,8% |                |
| 2021   | 36,1 |      |      |      |      |      |      |      |      |      | 36,1           |
| 2022   | 36,1 | 36,1 |      |      |      |      |      |      |      |      | 72,2           |
| 2023   | 36,1 | 36,1 | 36,1 |      |      |      |      |      |      |      | 108,2          |
| 2024   | 36,1 | 36,1 | 36,1 | 36,1 |      |      |      |      |      |      | 144,3          |
| 2025   | 36,1 | 36,1 | 36,1 | 36,1 | 36,1 |      |      |      |      |      | 180,4          |
| 2026   | 36,1 | 36,1 | 36,1 | 36,1 | 36,1 | 36,1 |      |      |      |      | 216,5          |
| 2027   | 36,1 | 36,1 | 36,1 | 36,1 | 36,1 | 36,1 | 36,1 |      |      |      | 252,5          |
| 2028   | 36,1 | 36,1 | 36,1 | 36,1 | 36,1 | 36,1 | 36,1 | 36,1 |      |      | 288,6          |
| 2029   | 36,1 | 36,1 | 36,1 | 36,1 | 36,1 | 36,1 | 36,1 | 36,1 | 36,1 |      | 324,7          |
| 2030   | 36,1 | 36,1 | 36,1 | 36,1 | 36,1 | 36,1 | 36,1 | 36,1 | 36,1 | 36,1 | 360,8          |
| <b>TOTAL CUMULATIVE TARGET FOR THE PERIOD 2021 – 2030 [ktoe]</b> |      |      |      |      |      |      |      |      |      |      | <b>1.984,3</b> |
| <b>TOTAL CUMULATIVE TARGET FOR THE PERIOD 2021 – 2030 [PJ]</b>   |      |      |      |      |      |      |      |      |      |      | <b>83,1</b>    |
| <b>Annual savings [PJ]</b>                                       |      |      |      |      |      |      |      |      |      |      | <b>1,5</b>     |

(d) application of exceptions (b), (c), (d), (e) and (f) from Article 7, paragraphs 2 and 3 of the Directive 2012/27/EU :

- i. final energy consumption in industries [in ktoe] as given in Annex I of the Directive 2003/87/EZ, which is excluded from the calculation in line with Article 7 point (b) of the Directive 2012/27/EU

|  | 2015.          | 2016. | 2017. |
|--|----------------|-------|-------|
| EU ETS plants                                  | 703,8          | 712,8 | 711,7 |
| <b>AVERAGE [ktoe]</b>                          | <b>709,4</b>   |       |       |
| <b>New basis for target calculation [ktoe]</b> | <b>3.800,3</b> |       |       |

| Basis for target calculation 1.(b) – 2.(b)- 2.(d)i. [ktoe]       |      |      |      |      |      |      |      |      |      |      | 3.800,3        |
|--|------|------|------|------|------|------|------|------|------|------|----------------|
| <b>Annual savings [ktoe]</b>                                     | 0,8% | 0,8% | 0,8% | 0,8% | 0,8% | 0,8% | 0,8% | 0,8% | 0,8% | 0,8% |                |
| <b>2021</b>  | 30,4 |      |      |      |      |      |      |      |      |      | 30,4           |
| <b>2022</b>  | 30,4 | 30,4 |      |      |      |      |      |      |      |      | 60,8           |
| <b>2023</b>  | 30,4 | 30,4 | 30,4 |      |      |      |      |      |      |      | 91,2           |
| <b>2024</b>  | 30,4 | 30,4 | 30,4 | 30,4 |      |      |      |      |      |      | 121,6          |
| <b>2025</b>  | 30,4 | 30,4 | 30,4 | 30,4 | 30,4 |      |      |      |      |      | 152,0          |
| <b>2026</b>  | 30,4 | 30,4 | 30,4 | 30,4 | 30,4 | 30,4 |      |      |      |      | 182,4          |
| <b>2027</b>  | 30,4 | 30,4 | 30,4 | 30,4 | 30,4 | 30,4 | 30,4 |      |      |      | 212,8          |
| <b>2028</b>  | 30,4 | 30,4 | 30,4 | 30,4 | 30,4 | 30,4 | 30,4 | 30,4 |      |      | 243,2          |
| <b>2029</b>  | 30,4 | 30,4 | 30,4 | 30,4 | 30,4 | 30,4 | 30,4 | 30,4 | 30,4 |      | 273,6          |
| <b>2030</b>  | 30,4 | 30,4 | 30,4 | 30,4 | 30,4 | 30,4 | 30,4 | 30,4 | 30,4 | 30,4 | 304,0          |
| <b>TOTAL CUMULATIVE TARGET FOR THE PERIOD 2021 – 2030 [ktoe]</b> |      |      |      |      |      |      |      |      |      |      | <b>1.672,1</b> |
| <b>TOTAL CUMULATIVE TARGET FOR THE PERIOD 2021 – 2030 [PJ]</b>   |      |      |      |      |      |      |      |      |      |      | <b>70,0</b>    |
| <b>Annual savings [PJ]</b>                                       |      |      |      |      |      |      |      |      |      |      | <b>1,3</b>     |

- ii. amount of energy savings [in ktoe] achieved in energy conversion, distribution and transmission sectors, including infrastructure for efficient centralized heating and cooling, in accordance with Article 7 (4) (c) of the Directive 2012/27/EU

The potential for increasing the energy efficiency of the electricity transmission infrastructure was assessed in the Ten-Year Transmission System Development Plan for the period 2019-2028 of the Croatian Transmission System Operator (HOPS) (see measure ENU-14). Based on these estimates, the cumulative expected energy savings due to the reduction of transmission losses for the period 2021 to 2030, amount to 1,443 GWh and 124.1 ktoe (5.2 PJ), respectively.

The potential for increasing the energy efficiency of the electricity distribution infrastructure has been assessed in the Ten-Year Distribution Network Development Plan for the period 2019-2028 by the HEP - Distribution System Operator (HEP-ODS) (see measure ENU-15). Based on these estimates, the cumulative expected energy savings due to the reduction of distribution network losses for the period 2021 to 2030 are 284 GWh or 24.4 ktoe (1.0 PJ).

Taking into account the impact of these measures by 2030, **the total amount of cumulative savings is 1,720 GWh, or 148.5 ktoe (6.2 PJ).**

- iii. *amount of energy savings [in ktoe] resulting from individual measures implemented since 31<sup>st</sup> December 2008 that continue to have an impact in 2020 and beyond, in accordance with Article 7 (4) (d) of the Directive 2012/27/EU*

The measures whose implementation started in Croatia based on the 3rd National Energy Efficiency Action Plan for the period 2014 to 2016, and which will, considering their lifetime, continue to produce impacts also in the period until 2030 are the building energy renovation programmes (for multi-apartment buildings, single family houses, public sector buildings and commercial buildings) and public lighting. Those measures' lifetime is 20 years for buildings and 15 years for public lighting in accordance with the Ordinance on the system for monitoring, measurement and verification of energy savings (OG 71/2015).

The savings achieved based on these measures in the period from 2014 until 2016, according to the data from the 4th NEEAP as well as the cumulative effect of these measures in the period from 2021 until 2030 are presented in the table below.

| <b>Measure</b>   | <b>Savings in the period 2014-2016 [PJ]</b> | <b>Savings in the period 2014-2016 [ktoe]</b> |
|--|---|---|
| <b>Apartment buildings energy renovation scheme 2014-2016</b>                  | 0,15  | 3,57  |
| <b>Family houses energy renovation scheme 2014-2016</b>                        | 0,70  | 16,72   |
| <b>Public sector buildings energy renovation scheme 2014-2015</b>              | 0,18  | 4,23  |
| <b>Commercial non-residential buildings energy renovation scheme 2014-2016</b> | 0,04  | 1,04  |
| <b>Energy Efficient Public Lighting Programme</b>                              | 0,08  | 1,95  |
| <b>TOTAL</b>   | <b>1,15</b>                                 | <b>27,52</b>                                  |
| <b>CUMULATIVE SAVINGS IN THE PERIOD 2021 –2030</b>                             | <b>11,52</b>                                | <b>275,16</b>                                 |

- iv. *amount of energy savings [in ktoe] from policy measures that result in individual actions undertaken after 1<sup>st</sup> January 2018 and before 31<sup>st</sup> December 2020, which deliver savings after 31<sup>st</sup> December 2020, including the assumed lifetime for each category of measures, in accordance with Article 7 (4) (e) of the Directive 2012/27/EU*

Since January 2018 several energy efficiency measures have been applied in Croatia. Residential and public buildings energy renovation schemes, co-funded from ESI funds, are implemented most intensively through public calls for grants. Individual building energy renovation projects have been producing impacts since 2018 and will continue to do so until 2030, since the lifetime of the integral building energy renovation measures is 20 years, in accordance with the Ordinance on the system for monitoring, measurement and verification of energy savings (OG 71/2015). An assessment of cumulative savings is presented in the table below, and data on the savings are taken over from the following analyses: "Revision of the calculation of result indicators for the Specific Objective 4c2: Reduction of energy consumption of the residential buildings (multi-apartment buildings and family houses) under the Operational Programme Competition and Cohesion 2014-2020" (Ministry of Construction and Physical Planning, July 2017) and "Revision of the calculation of result indicators for the Specific Objective 4c1: Reduction of energy consumption in the public sector buildings under the Operational Programme Competition and Cohesion 2014-2020" (Ministry of Construction and Physical Planning, July 2017). Final energy savings are presented in the table below.

| Savings [ktoe/year] / Year                                  | 2018         | 2019         | 2020         | 2021          | 2022          | 2023            |
|---|--------------|--------------|--------------|---------------|---------------|-----------------|
| Savings in multi-apartment buildings upon first public call | 53.26        | 53.26        | 53.26        | 53.26         | 53.26         | 53.26           |
| Savings in family houses upon first public call             |              |              |              | 15.62         | 31.24         | 46.86           |
| Savings in multi-apartment buildings upon second public     |              |              | 13.32        | 13.32         | 13.32         | 13.32           |
| Savings based on the Pilot Project 4c1.2                    | 4.30         | 4.30         | 4.30         | 4.30          | 4.30          | 4.30            |
| Savings per public call 4c1.3 - 2019                        |              | 29.26        | 29.26        | 29.26         | 29.26         | 29.26           |
| Savings per public call 4c1.3 - 2020                        |              |              | 6.89         | 6.89          | 6.89          | 6.89            |
| Savings per new public calls - 2020                         |              |              | 9.47         | 9.47          | 9.47          | 9.47            |
| Savings per new public calls - 2021                         |              |              |              | 12.05         | 12.05         | 12.05           |
| Savings per new public calls - 2022                         |              |              |              |               | 14.63         | 14.63           |
| Savings per new public calls - 2023                         |              |              |              |               |               | 18.07           |
| <b>TOTAL ANNUAL SAVINGS</b>                                 | <b>57.56</b> | <b>86.82</b> | <b>116.5</b> | <b>144.17</b> | <b>174.42</b> | <b>208.11</b>   |
| <b>TOTAL CUMULATIVE SAVINGS IN THE PERIOD 2018-2023</b>     |              |              |              |               |               | <b>787.58</b>   |
| <b>TOTAL CUMULATIVE SAVINGS IN THE PERIOD 2021-2030</b>     |              |              |              |               |               | <b>1,983.47</b> |

The table shows only the estimates; the data on the actually achieved energy savings in 2018 at the time of the preparation of this document are not available. However, these estimates are shown for the purpose of proving the implementation of measures and individual actions under these measures that could significantly affect the goal reduction for the period from 2021 until 2030.

- v. *amount of energy [in ktoe] generated on or in buildings for own use as a result of policy measures promoting new installation of renewable energy technologies in line with Article 7 (4) (f) of the Directive 2012/27/EU*

Indeterminable.

- vi. *amount of excess energy savings [in ktoe] achieved in the period from 1<sup>st</sup> January 2014 to 31<sup>st</sup> December 2020, which member States count towards the period from 1<sup>st</sup> January 2021 until 31<sup>st</sup> December 2030, in line with Article 7, paragraph 4a of the Directive 2012/27/EU*

Not applicable, i.e. there are no excess energy savings in the period from 1st January 2014 to 31st December 2020.

- (e) *total cumulative amount of energy savings [in ktoe] (after the application of the exception under Article 7 (4), from (b) to (g) of the Directive 2012/27/EU*

If only exceptions (i), (ii) and (iii) indicated under item (f) are used, the cumulative target would be significantly reduced, as shown in the table below. Taking into consideration cumulative savings under (iv), the overall target would be achieved. However, taking into consideration the provisions of Article 3(a), paragraph (b) of the Directive, according to which the reduction of energy savings target may not exceed 35 % in relation to the target calculated according to item (c), the table below determines the target with applied this maximum reduction.

|   |         |                             |
|---|---------|-----------------------------|
| <b>TOTAL CUMULATIVE TARGET FOR THE PERIOD 2021 –2030 [ktoe]</b> | 1.984,3 | <b>Target reduction [%]</b> |
|---|---------|-----------------------------|

|  |                |             |
|--|----------------|-------------|
| TOTAL CUMULATIVE TARGET FOR THE PERIOD 2021 -2030 after exception (i) [ktoe]                       | 1.672,1        | 15,7        |
| TOTAL CUMULATIVE TARGET FOR THE PERIOD 2021 -2030 after exception (i) + (ii) [ktoe]                | 1.523,6        | 23,2        |
| TOTAL CUMULATIVE TARGET FOR THE PERIOD 2021 -2030 after exception (i) + (ii) + (iii) [ktoe]        | 1.248,5        | <b>37,1</b> |
| TOTAL CUMULATIVE TARGET FOR THE PERIOD 2021 -2030 after exception (i) + (ii) + (iii) + (iv) [ktoe] | 0,8            | 99,9        |
| <b>TOTAL CUMULATIVE TARGET FOR THE PERIOD 2021 -2030 with a 35 % reduction [ktoe]</b>              | <b>1.289,8</b> | <b>35,0</b> |

Annual distribution of the target is presented in the table below.

|   | 0,8% | 0,8% | 0,8% | 0,8% | 0,8% | 0,8% | 0,8% | 0,8% | 0,8% | 0,8%           |       |
|---|------|------|------|------|------|------|------|------|------|----------------|-------|
| <b>Annual savings [ktoe]</b>                                    |      |      |      |      |      |      |      |      |      |                |       |
| <b>2021</b>   | 23,5 |      |      |      |      |      |      |      |      |                | 23,5  |
| <b>2022</b>   | 23,5 | 23,5 |      |      |      |      |      |      |      |                | 46,9  |
| <b>2023</b>   | 23,5 | 23,5 | 23,5 |      |      |      |      |      |      |                | 70,4  |
| <b>2024</b>   | 23,5 | 23,5 | 23,5 | 23,5 |      |      |      |      |      |                | 93,8  |
| <b>2025</b>   | 23,5 | 23,5 | 23,5 | 23,5 | 23,5 |      |      |      |      |                | 117,3 |
| <b>2026</b>   | 23,5 | 23,5 | 23,5 | 23,5 | 23,5 | 23,5 |      |      |      |                | 140,7 |
| <b>2027</b>   | 23,5 | 23,5 | 23,5 | 23,5 | 23,5 | 23,5 | 23,5 |      |      |                | 164,2 |
| <b>2028</b>   | 23,5 | 23,5 | 23,5 | 23,5 | 23,5 | 23,5 | 23,5 | 23,5 |      |                | 187,6 |
| <b>2029</b>   | 23,5 | 23,5 | 23,5 | 23,5 | 23,5 | 23,5 | 23,5 | 23,5 | 23,5 |                | 211,1 |
| <b>2030</b>   | 23,5 | 23,5 | 23,5 | 23,5 | 23,5 | 23,5 | 23,5 | 23,5 | 23,5 | 23,5           | 234,5 |
| <b>TOTAL CUMULATIVE TARGET FOR THE PERIOD 2021 –2030 [ktoe]</b> |      |      |      |      |      |      |      |      |      | <b>1.289,8</b> |       |
| <b>TOTAL CUMULATIVE TARGET FOR THE PERIOD 2021 –2030 [PJ]</b>   |      |      |      |      |      |      |      |      |      | <b>54,0</b>    |       |
| <b>Annual savings [PJ]</b>                                      |      |      |      |      |      |      |      |      |      | <b>1,0</b>     |       |

It can be concluded that the targeted cumulative savings for the period 2021-2030 for the Republic of Croatia equal 1,289.8 ktoe (54.0 PJ), which corresponds to average new annual savings of 23.5 ktoe (1.0 PJ).

### **3. Policy measures in view of the achievement of the savings requirement referred to in Article 7, paragraph 1 of the Directive 2012/27/EU**

#### **3.1. Energy efficiency obligation scheme referred to in Article 7a of the Directive 2012/27/EU**

##### *(a) description of the energy efficiency obligations scheme*

The energy efficiency obligations scheme is stipulated by the Energy Efficiency Act (NN br. 127/14, 116/18), and its functioning is additionally explained by a special regulation (ordinance) arising from the Act – Ordinance on energy efficiency obligation scheme (NN 41/19). In the following text, the energy efficiency obligation system is described.

The obligation scheme is prescribed for energy suppliers (obligated parties). The Ministry competent for energy determines, in a special decision, for each obligated party, by 30<sup>th</sup> June of the present year, the exact annual amount of energy savings in kWh for the following year, based on the amount of energy that the obligated party has delivered to final consumers or to distribution stations selling energy to final consumers, in the year preceeding the last year. The annual obligation may:

- be reduced by savings achieved by alternative measures in the considered year,
- be reduced by the share of biofuels that parties (also obligated parties) putting in the market diesel or gasoline for fueling motor vehicles are obliged to put in the market, based on special regulation stipulating use of biofuels in transport,
- be reduced by the share of energy that was supplied to the consumer who is a producer, distributor or supplier of thermal energy,
- be reduced by the share of energy that was supplied to the industry participating in the ETS
- be reduced by excess energy savings that the obligated party achieved in previous years.

For unachieved savings not exceeding 10% of the target in previous year, the Ministry in its decision for the obligated party will increase annual energy savings to be achieved by the obligated party for the amount of unachieved savings. For unachieved savings exceeding 10% of the target in previous year, the Ministry will stipulate the amount that the obligated party will pay to the Fund for Environmental Protection and Energy Efficiency, on a one-off basis.

From 2020 onwards, obligated parties are obliged to deliver a report on achieved energy savings, final consumers and their consumption in previous year to the Ministry, together with aggregated statistical data on final consumers (and possible significant changes in relation to earlier reports), as well as current information on final consumers consumption, including load curves, consumer segmentation and geographical location.

##### *(b) expected cumulative and annual amount of savings and duration of the obligation period(s)*

According to the Ordinance on the energy efficiency obligation scheme (NN 41/19), in the period 2021-2030 50% of new energy savings will be achieved through the energy efficiency obligation scheme. The cumulative target for the entire period equals 644,9 ktoe (27,0 PJ) and at annual level 11,7 ktoe (0,5 PJ).

*(c) obligated parties and their responsibilities*

Starting from 2021 and all the years thereafter, obligated parties are all energy suppliers who supplied more than 50 GWh of energy in the previous year.

*(d) target sectors*

Target sectors for achieving energy savings are not prescribed.

*(e) eligible actions foreseen under the measure*

The obligated parties fulfil their obligation by:

- investing in and stimulating energy efficiency improvement in final consumption so as to achieve these investments as new energy savings, not excluding investments in electricity production and selfconsumption, small and micro CHPs, advanced meters at final consumers/energy buyers and all other investments and incentives for which obliged party can prove new energy savings ;
- buying off the saving from another obligated party;
- paying in a certain fee into the Environment Protection and Energy Efficiency Fund;
- investment and stimulation resulting in an effect greater than that of any measure effected in regular market conditions
- investing and stimulating measures or activities which, at the time when the investment is contracted or starts running (whichever comes later), are not encompassed by other policy measures for achieving energy savings foreseen beyond the obligations scheme (alternative measures).

*(f) information on the application of the following provisions of the Directive 2012/27/EU*

- (i) if applicable, (i) specific actions for achieving a part of the savings in households affected by energy poverty in line with article 7. paragraph 11.*

Obligated parties are encouraged to increase the energy efficiency first and foremost in households with users of the fee for endangered energy buyer and in households in areas with developmental specificities, in the following manner:

- energy savings achieved through final consumption measures implemented in areas with development specificities are increased by 10%;
- energy savings achieved in households with endangered energy buyers are increased by 10%.

For measures implemented in households with endangered energy buyers and in areas with developmental specificities, these increments can be cumulated.

- (ii) savings achieved by energy services providers or other third parties in accordance with Article 7a, paragraph 5, item (b);*

Obligated parties can meet their obligation in the energy savings market, but the regulations do not restrict the market to solely obligated parties and energy savings providers. The Ordinance defines that the savings purchased are proven by the signature of a natural or legal person authorized to design or certify. The savings certificate is issued to the savings holder through the Energy Saving Measurement and Verification System (SMiV). Pursuant to the



Ordinance on the system for monitoring, measuring and verifying energy savings (NN 71/15), certificates can be transferred through SMiV under an agreement signed by the savings holder and the person to whom the savings are transferred.

*(iii) "banking and borrowing" in accordance with Article 7a, paragraph 5b*

The obligated party is allowed to include, at its request, the achieved but previously non-accounted evidenced savings in previous years, in any year of current or next cumulating period.

*(g) information on trading of energy savings (if relevant).*

The obligated parties may trade in savings, i.e. an obligated party may achieve its obligation also by buying off the saving from another obligated party.

*3.2. Alternative measures referred to in Article 7b and Article 20, paragraph 6 of the Directive 2012/27/EU (except taxation):*

*(a) type of policy measure*

*(b) brief description of the policy measure including the design features per each policy measure notified*

*(c) expected total cumulative and annual amount of savings per each measure and/or amount of energy savings in relation to any intermediate periods*

*(d) implementing public authorities, obligated parties or entrusted parties and their responsibilities for implementing policy measure(s)*

*(e) target sectors*

*(f) eligible activities foreseen under the measure*

*(g) special policy measures or individual actions focused on energy poverty*

The above required data for all the foreseen alternative measures are indicated in the table below.

| <b>Id.</b>   | <b>Name of measure</b>  | <b>Type of measure (a)</b>    | <b>Brief description of the measure (b)</b>  | <b>Annual savings (c)</b>     | <b>Implementing authority (d)</b>   | <b>Target sector (e)</b>                 | <b>Eligible activities (f)</b>  |
|--------------|---|-------------------------------|--|-------------------------------|---|--|---|
| <b>ENU-3</b> | <i>Multi-partment buildings (MAB) energy renovation programme</i> | <i>Financial</i>              | <i>Grants for MAB/SFH energy renovation aimed at achieving a reduction of thermal requirements of a building of at least 50 %: for SFH with a satisfactory condition of the external</i> | <i>3.54 ktoe<br/>0.148 PJ</i> | <i>Ministry of Construction and Physical Planning (MCPP) – Programme adoption MCPP – PT1 EPEEF - PT2 EPEEF - technical assistance</i> | <i>Households</i>                        | <ul style="list-style-type: none"> <li>▪ <i>Energy audit and energy certification before and after renovation</i></li> <li>▪ <i>Preparation of design documentation (if necessary)</i></li> <li>▪ <i>Energy renovation equipment and works (envelope, joinery, HVAC, RES, indoor lighting, etc.)</i></li> <li>▪ <i>Professional and designer supervision (if necessary)</i></li> <li>▪ <i>Technical assistance</i></li> </ul> |
| <b>ENU-4</b> | <i>Single family houses (SFH) energy renovation programme</i>     | <i>Financial</i>              | <i>envelope, co-funding of individual energy efficiency and renewable energy sources measures; intensified stimulation up to the nZEB standard</i>                                       | <i>4.56 ktoe<br/>0.191 PJ</i> | <i>MCPP – Programme adoption EPEEF - implementation</i>   |  |   |
| <b>ENU-5</b> | <i>Public sector buildings energy renovation programme</i>        | <i>Financial</i>              | <i>Grants for public buildings energy renovation or ESCO model for buildings demonstrating high cost-effectiveness of EE measures; intensified stimulation up to nZEB standard</i>       | <i>4.04 ktoe<br/>0.169 PJ</i> | <i>MCPP – Programme adoption MCPP – PT1 EPEEF - PT2 EPEEF - technical assistance (grants) APN - ESCO model</i>                        | <i>Services sector (public services)</i> | <ul style="list-style-type: none"> <li>▪ <i>Energy audit and energy certification before and after renovation</i></li> <li>▪ <i>Preparation of design documentation</i></li> <li>▪ <i>Energy renovation equipment and works (envelope, joinery, HVAC, RES, indoor lighting, etc.)</i></li> <li>▪ <i>Professional and designer supervision</i></li> <li>▪ <i>Technical assistance</i></li> </ul>                               |
| <b>ENU-6</b> | <i>Systematic energy management in the public sector</i>          | <i>Obligatory information</i> | <i>EMIS upgrade and its application in the entire public sector, implementation of organizational-educational measures for energy consumption reduction in public sector buildings</i>   | <i>2.39 ktoe<br/>0.100 PJ</i> | <i>APN</i>  | <i>Services sector (public services)</i> | <ul style="list-style-type: none"> <li>▪ <i>EMIS functionality improvement</i></li> <li>▪ <i>Introduction of remote measurements into all public sector buildings</i></li> <li>▪ <i>Linking the EMIS with other systems</i></li> <li>▪ <i>Implementation of organizational-educational activities</i></li> </ul>  |
| <b>ENU-7</b> | <i>Street lighting energy renovation programme</i>                | <i>Financial</i>              | <i>Setting up of a financing model enabling project implementation according to the ESCO and PPP model</i>   | <i>2.15 ktoe<br/>0.090 PJ</i> | <i>Ministry of Environment and Energy (MEE) - Programme adoption MEE - PT1 EPEEF - PT2 EPEEF - technical assistance</i>               | <i>Services sector (public services)</i> | <ul style="list-style-type: none"> <li>▪ <i>Energy audit before and after renovation</i></li> <li>▪ <i>Preparation of design documentation</i></li> <li>▪ <i>Energy renovation equipment and works (bulbs, lamps, protective</i></li> </ul>   |

|              |   |                                  |   |                               |              |                   |   |
|--------------|---|----------------------------------|---|-------------------------------|--------------|-------------------|---|
|              |   |                                  |   |                               |              |                   | <ul style="list-style-type: none"> <li>and control equipment, cabling, poles, etc.)</li> <li>▪ Professional and designer supervision</li> <li>▪ Technical assistance</li> </ul>   |
| <b>TR-9</b>  | <i>Financial incentives for energy efficient vehicles</i>   | <i>Financial</i>                 | <i>Co-financed purchase of electric, CNG, LNG and hydrogen vehicles</i>   | <i>0.43 ktoe<br/>0.018 PJ</i> | <i>EPEEF</i> | <i>Transport</i>  | <ul style="list-style-type: none"> <li>▪ Vehicle purchase</li> </ul>  |
| <b>TR-11</b> | <i>Stimulating integrated and intelligent transport and development of the infrastructure for alternative fuels at the local and regional level</i> | <i>Financial</i>                 | <i>Co-financing of sustainable traffic solutions in cities</i>  | <i>0.50 ktoe<br/>0.021 PJ</i> | <i>EPEEF</i> | <i>Transport</i>  | <ul style="list-style-type: none"> <li>▪ Optimization of the cargo transport logistics; intelligent public parking space management, introduction of integrated passenger transport, introduction of car sharing, public city bicycles systems and construction of cycling infrastructure, intelligent management in transport (advanced signalization and control)</li> </ul>                              |
| <b>TR-12</b> | <i>Eco-driving trainings</i>  | <i>Information<br/>Financial</i> | <i>Training on eco-driving driving in short sessions (in the duration of app. 60-120 minutes) and implementing of the national promo campaign</i> | <i>0.26 ktoe<br/>0.011 PJ</i> | <i>EPEEF</i> | <i>Transport</i>  | <ul style="list-style-type: none"> <li>▪ Eco-driving training sessions</li> <li>▪ Promo campaign</li> </ul>   |
| <b>UET-5</b> | <i>Co-financing the implementation of energy efficiency measures in households in energy poverty</i>  | <i>Financial<br/>Information</i> | <i>Co-financing the implementation of technical measures in households in energy poverty</i>  | <i>0.10 ktoe<br/>0.004 PJ</i> | <i>EPEEF</i> | <i>Households</i> | <ul style="list-style-type: none"> <li>▪ Replacing household appliances according to the "old for new" rule</li> <li>▪ Improvement or replacement of the heating system with a system which is environmentally friendlier, economically more favourable and more energy efficient, and especially with a system powered by renewable energy sources</li> <li>▪ Simple energy efficiency measures</li> </ul> |

The table below shows the expected cumulative savings based on alternative measures in the period from 2021 to 2030

| <b>Id.</b>  | <b>2021.</b> | <b>2022.</b> | <b>2023.</b> | <b>2024.</b> | <b>2025.</b> | <b>2026.</b> | <b>2027.</b> | <b>2028.</b> | <b>2029.</b> | <b>2030.</b> | <b>Energy savings [ktoe]</b> |
|---|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|------------------------------|
| <b>ENU-3</b>  | 3,54         | 7,08         | 10,62        | 14,16        | 17,7         | 21,24        | 24,78        | 28,32        | 31,86        | 35,4         | 194,70                       |
| <b>ENU-4</b>  | 4,56         | 9,12         | 13,68        | 18,24        | 22,8         | 27,36        | 31,92        | 36,48        | 41,04        | 45,6         | 250,80                       |
| <b>ENU-5</b>  | 4,04         | 8,08         | 12,12        | 16,16        | 20,2         | 24,24        | 28,28        | 32,32        | 36,36        | 40,4         | 222,20                       |
| <b>ENU-6</b>  | 2,39         | 4,78         | 4,78         | 4,78         | 4,78         | 4,78         | 4,78         | 4,78         | 4,78         | 4,78         | 45,41                        |
| <b>ENU-7</b>  | 2,15         | 4,3          | 6,45         | 8,6          | 10,75        | 12,9         | 15,05        | 17,2         | 19,35        | 21,5         | 118,25                       |
| <b>TR-9</b>   | 0,43         | 0,86         | 1,29         | 1,72         | 2,15         | 2,58         | 3,01         | 3,44         | 3,87         | 4,3          | 23,65                        |
| <b>TR-11</b>  | 0,50         | 1,00         | 1,50         | 2,00         | 2,50         | 2,50         | 2,50         | 2,50         | 2,50         | 2,50         | 20,00                        |
| <b>TR-12</b>  | 0,26         | 0,52         | 0,52         | 0,52         | 0,52         | 0,52         | 0,52         | 0,52         | 0,52         | 0,52         | 4,94                         |
| <b>UET-5</b>  | 0,10         | 0,20         | 0,30         | 0,40         | 0,50         | 0,60         | 0,70         | 0,80         | 0,90         | 1,00         | 5,50                         |
| <b>TOTAL CUMULATIVE SAVINGS IN THE PERIOD 2021 –2030 ACHIEVED THROUGH ALTERNATIVE MEASURES [ktoe]</b> |              |              |              |              |              |              |              |              |              |              | 885,45                       |
| <b>TOTAL CUMULATIVE SAVINGS IN THE PERIOD 2021 –2030 ACHIEVED THROUGH ALTERNATIVE MEASURES [PJ]</b>   |              |              |              |              |              |              |              |              |              |              | 37,07                        |
| <b>THE SHARE OF SAVINGS ACHIEVED THROUGH ALTERNATIVE MEASURES [%]</b>                                 |              |              |              |              |              |              |              |              |              |              | 71,18                        |

### 3.3. Information on taxation measures:

- (a) *brief description of the taxation measure;*
- (b) *duration of the taxation measure;*
- (c) *implementing authority*
- (d) *expected cumulative and annual amount of savings per measure;*
- (e) *target sectors;*
- (f) *additionality of energy savings by describing the approach to savings calculation, including the price elasticity used in accordance with Annex V, item 4*

In the National Energy and Climate Plan, two fiscal measures are foreseen for stimulating energy efficiency: ENU-9-Systematic energy management in the business sector (target sectors: industry and commercial services) and TR-3-Special tax on motor vehicles based on CO<sub>2</sub> emissions (target sector: transport). Both these measures require detailed analyses to establish the methodology of monitoring and calculation of savings resulting from these measures.

### **4. Calculation methodology for measures notified under Articles 7a, 7b and Article 20, paragraph 6 of Directive 2012/27/EU (except taxation measures):**

- (a) *applied measurement methods under item 1 of Annex V to Directive 2012/27/EU*

For calculating the savings, assessment methods are used as per Annex II of the Ordinance on the system for monitoring, measurement and verification of energy savings (OG 71/2015). These are bottom-up measures used for assessing energy savings achieved through the application of individual energy-efficiency improvement measures (in line with item 1 (a) of Annex V to Directive 2012/27/EU).

The Ordinance also allows determining the savings by measuring physical items, i.e. by calculating the difference between actual and reference energy consumption (in line with item 1 (b) of Annex V to Directive 2012/27/EU).

Until the day this Plan starts to apply, the concerned Ordinance will be amended, especially in the part relating to bottom-up methods and reference values used therein, and also in terms of prescribing new methods that include research establishing the effect on consumer behaviour (in line with item 1 (d) of Annex V of the Directive 2012/27/EU), since obligated parties will probably implement such activities.

- (b) *method to express energy savings (primary or final energy savings)*

Savings are expressed as final energy consumption.

- (c) *lifetime of the measures, the manner of their calculation and what they are based on*

The lifetime of the measures is prescribed by Annex II of the Ordinance on the system for monitoring, measurement and verification of energy savings. The values of the lifetime of the measures are taken over from the European Commission recommendations, back from the period of the Directive 2006/32/EC on energy services.

The savings established by assessment are monitored from the day of the entry of the evidence of savings into the Measurement and Verification System (SMIV), whereas for measures whose savings are established by measurement, the start is set to the beginning of the measurement, in accordance with the Ordinance on systematic energy management.

*(d) brief description of the calculation method, including how additionality and materiality of savings are ensured, and which methodologies and benchmarks are used for deemed and scaled savings*

The methodology for calculating savings from individual measures is based on the bottom-up method, i.e. on mathematical equations calculating the difference in energy consumption before and after the implementation of the energy efficiency improvement measure. The calculation allows for the use of predefined (reference data) or actual data for each project (action). If actual data are used, the relevant evidence must be entered into the SMIV:

- for the measures implemented by performing construction works, the first page of the certified design prepared by a person authorized for designing, with the calculation of savings in accordance with the methodology from Annex II of the Ordinance, characteristics of the built-in material and equipment and final report of professional supervision with a certificate on the as-built condition in accordance with the design,
- for the measures implemented by installing mechanical installations, a certificate of the as-built condition and system functionality containing the characteristics of the installed equipment/system, contractor's report on equipment installation and indication of the characteristics of the installed system before and after measure implementation, and calculation of energy savings in accordance with the methodology under Annex II of the Ordinance.

The additionality of measures is achieved by prescribing and achieving technical conditions surpassing the minimum conditions prescribed by the relevant legal regulations.

*(e) information on how the possible overlaps between policy measures and individual actions are addressed to avoid double counting of energy savings*

Double calculation of energy savings is avoided by:

- 1) defining measures, making sure they do no overlap
- 2) defining who is obligated to enter data into the SMIV: entities obligated to plan (large cities and counties); subsidy providers and energy services providers

The SMIV enables an overview of entered data and quick detection of any double entries of measures and their savings. The vast majority of measures in Croatia are implemented with the financial assistance or participation of the Environmental Protection and Energy Efficiency Fund (either as a subsidy provider or an intermediary authority in the ESI funds system). Therefore, such centralized entry also largely contributes to avoiding double entries and calculation of energy savings.

The Ordinance on the system for monitoring, measurement and verification of energy savings will be amended by aligning it with the Ordinance on the energy efficiency obligation scheme, which must be adopted based on the finally adopted amendments to the Energy Efficiency Act, and, through these subordinate acts, the obligations of the obligated parties regarding entry of data into the SMIV shall be established.

*(f) climatic variations and approach used (if relevant)*

Two climate regions are distinguished in Croatia: continental and coastal Croatia. This has already been taken into consideration in establishing the reference values used in savings assessment methods, in accordance with the Ordinance on the system for monitoring, measurement and verification of energy savings.

## **5. Monitoring and verification**

### *(a) brief description of the monitoring and verification system and the process of the verification*

The energy savings monitoring and verification system was established by the Energy Efficiency Act and the Ordinance on the system for monitoring, measurement and verification of energy savings, and it is based on the SMIV information platform. The legally defined savings holders are obligated to enter data on the implemented energy efficiency measures into this platform which, based on the assessment methods or measured data, calculates achieved energy savings resulting from these measures. Savings holders are counties, large cities (with a population exceeding 35,000), subsidy providers and energy services providers.

The verification of savings is done through the SMIV based on evidence entered into the system, indicated under item 3 (d) of this document. The certificate of achieved energy savings is issued to the savings holder and recorded in the SMIV. The savings certificate is transferable, and each transfer of the certificate is recorded in the SMIV.

### *(b) implementing public authority and its main responsibilities in terms of the monitoring and verification system in relation to the energy efficiency obligations scheme and /or alternative measures*

The savings verification is carried out by the National Energy Efficiency Authority, which is a special organizational unit at the Ministry of Environment and Energy. The EE Authority is responsible for managing the entire energy savings monitoring, measurement and verification system, for maintaining and developing the SMiV and reporting on the achieved savings at the annual level.

### *(c) independence of monitoring and verification from the obligated, participating or entrusted parties*

Since the monitoring and verification are under the competence of the Ministry, that is, of the EE Authority, independence from obligated parties as well as other savings holders is ensured.

### *(d) statistically significant proportion of energy efficiency improvement measures and proportion and criteria used to define and select a representative sample*

The verification of savings according to the currently valid Ordinance on the system for monitoring, measurement and verification of energy savings is carried out only at the request of the savings holder. The verification of energy savings achieved by obligated parties based on the statistically significant share and representative sample of measures implemented by obligated parties is currently not obligatory. The system must be prescribed through the amendments to the Ordinance on the system for monitoring, measurement and verification of energy savings as well as through the Ordinance on the energy efficiency obligation scheme to be adopted based on the finally adopted amendment to the Energy Efficiency Act.

### *(e) reporting obligations fo obligated parties (savings achieved by each obligated party or each obligated party's sub-category, and in total under the scheme)*

The manner of obligated parties' annual reporting on achieved energy savings will be prescribed by the Ordinance on the energy efficiency obligation scheme to be adopted based on the finally adopted amendments to the Energy Efficiency Act. The total savings within the

framework of the obligations system are an integral part of the Annual report on the progress made towards achieving the national energy efficiency targets (see item (f)).

*(f) publication of energy savings achieved (each year) under the energy efficiency obligation scheme and alternative measures*

According to the Energy Efficiency Act, the ministry responsible for energy, together with the ministry responsible for construction and the National Energy Efficiency Authority, drafts the Annual report on the progress made towards achieving the national energy efficiency targets, which are adopted by the Croatian Government by the 1<sup>st</sup> April for the previous year. The report is delivered to the European Commission.

*(g) information on Member States legislation on penalties to be applied in case of non-compliance*

According to the Energy Efficiency Act, the Ministry of Environment and Energy will adopt, *ex officio*, a decision by 31<sup>st</sup> March of the current year to define the amount to be paid by the obligated parties whose unachieved part of the obligations exceeds 10 % of the total annual obligation, on a one-time basis, to the Environment Protection and Energy Efficiency Fund, with a payment deadline of 30 days after the decision comes into force. The calculation of the amount which is to be paid by the obligated party into the Fund is based on the costs incurred by the Fund in the previous year per kWh of saved energy by investing into alternative measures, and which is published by the Minister in his decision by 31<sup>st</sup> March for the previous calendar year.

*(h) information on policy measures foreseen if the progress is not satisfactory*

There are currently no specific measures foreseen that would have to be undertaken in case of unsatisfactory progress in achieving the targets. The corrective measures must be applied both to the obligation scheme and the alternative measure. In the obligation scheme, one of the corrective measures can be the increase of the fee to be paid by the obligated parties into the Fund, which should be incorporated into the future Ordinance on the energy efficiency obligation scheme. In the alternative measures part, corrective activities include the increase of the scope of activities, more efficient implementation by adjusting administrative procedures and increasing of available funds for co-financing of the measures.