

# **GAS DISTRIBUTION TARIFFS IN CROATIA**

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**Training on Gas and Electricity Distribution Tariffs –  
Energy Community Secretariat**

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- ✓ Challenges in new gas distribution development

## ➤ REGULATORY ACCOUNT MODEL

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# Natural gas supply in Croatia

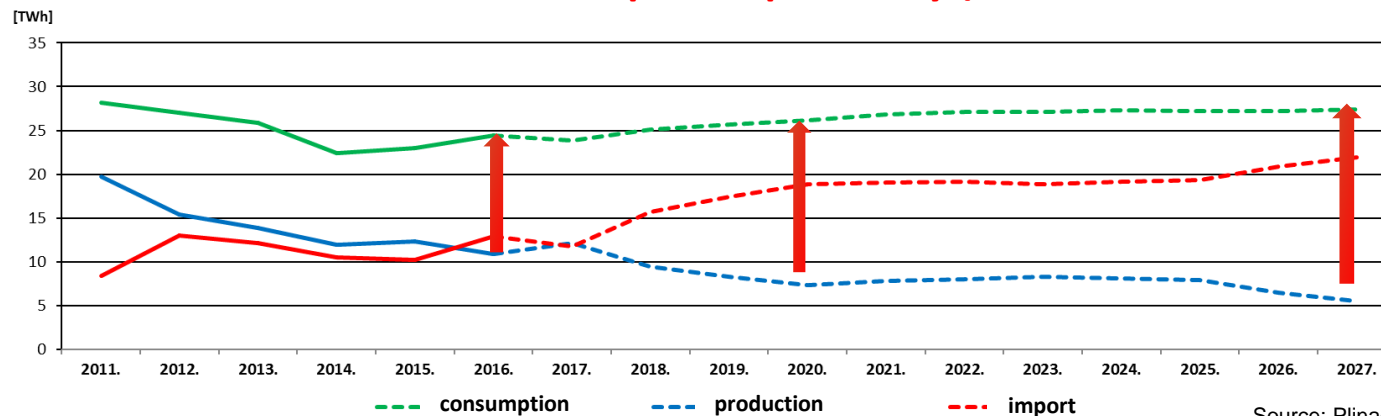
## Domestic Production Fields



## Import Routes

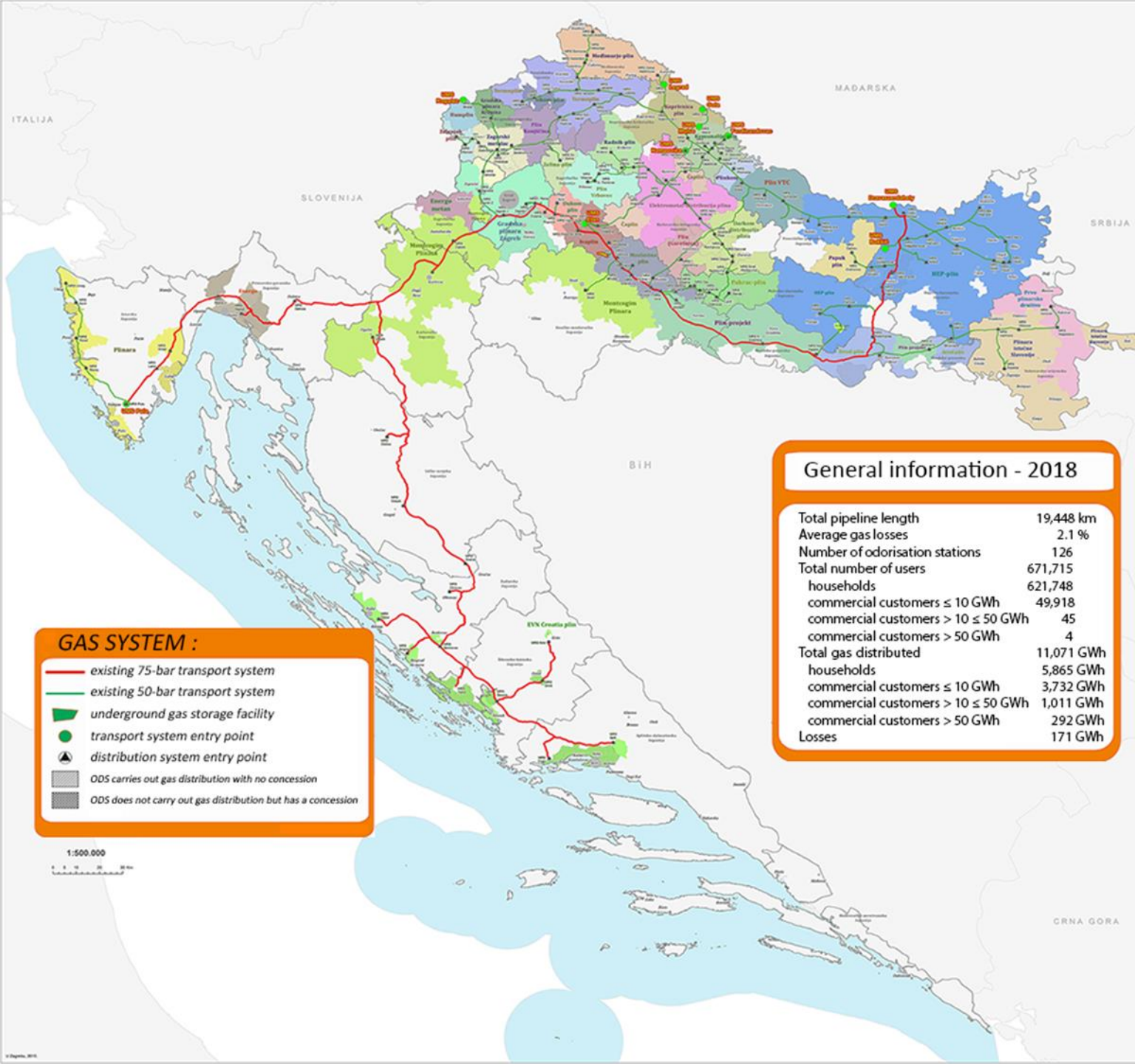


Since 2012 increased level of import dependency (32% 2007 -> 61% 2018)



# Natural gas system of Croatia - the state of play

- significant transmission capacity and interconnections with neighboring countries
- significant number of relatively small DSOs with different level of development



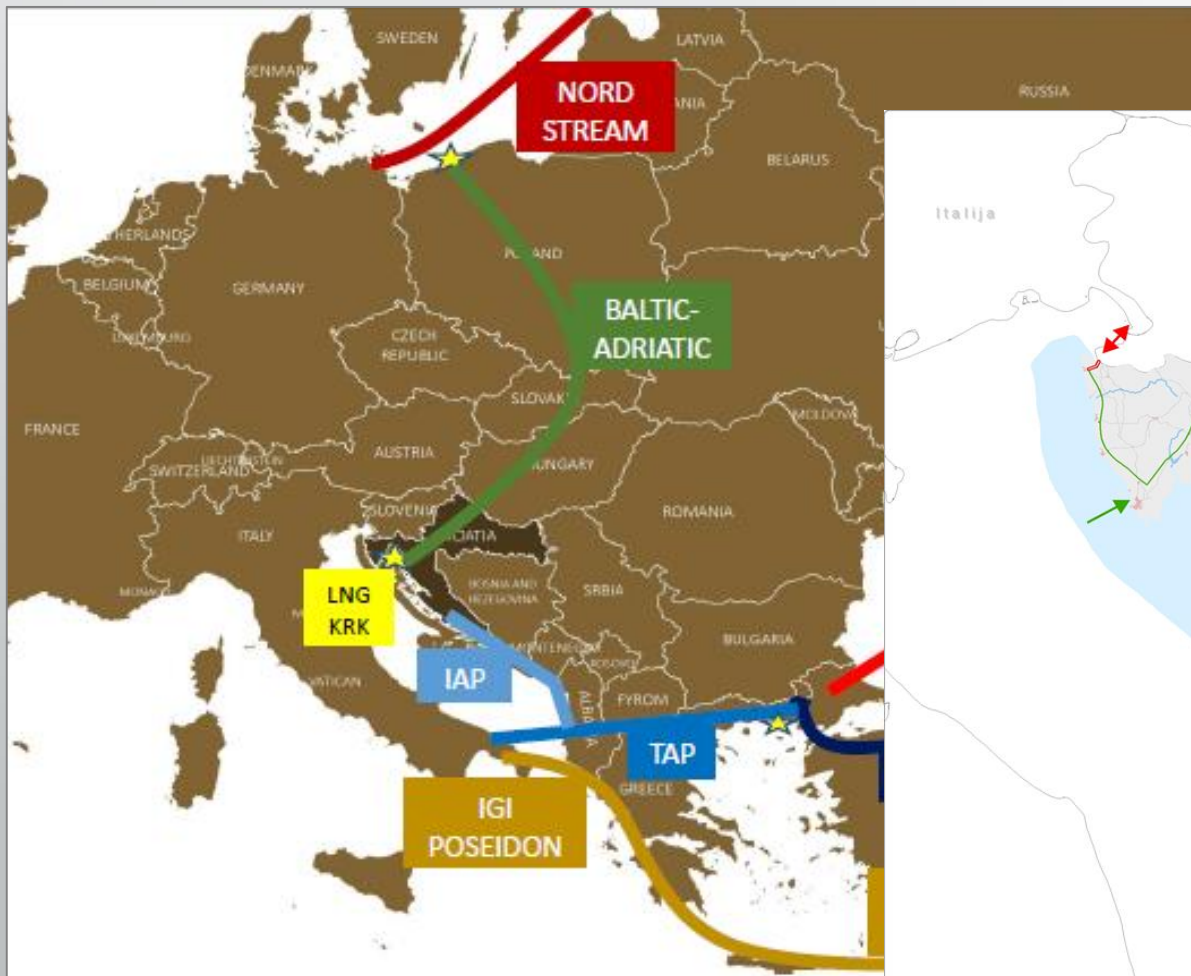
## CHALLENGES

- upgrading the system for domestic purposes and for transit use - connecting with new supply projects
- gasification of new uncovered areas in southern Croatia

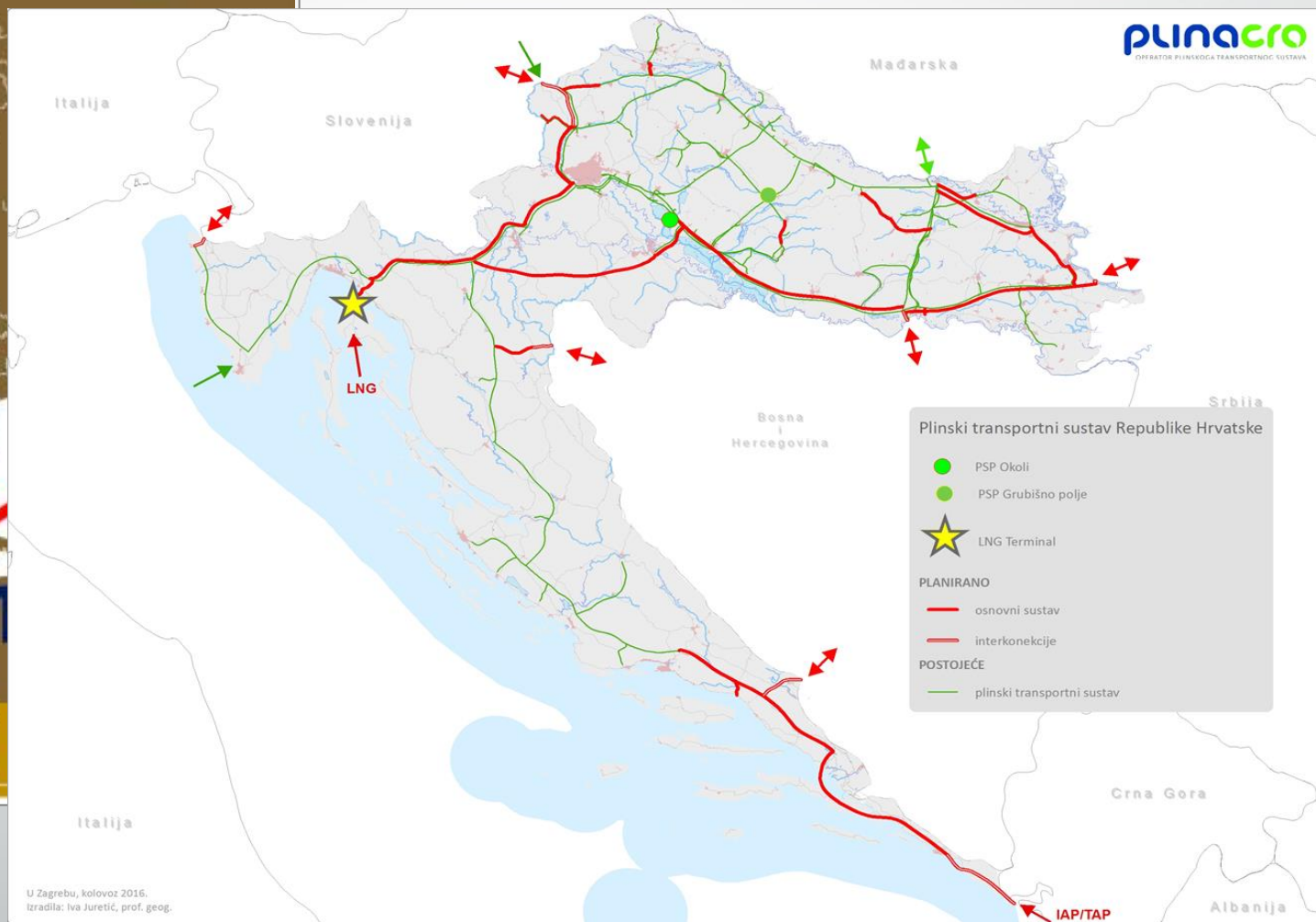




# Gas transmission system – possible future development



## Plinacro 10YNDP 2018-2027

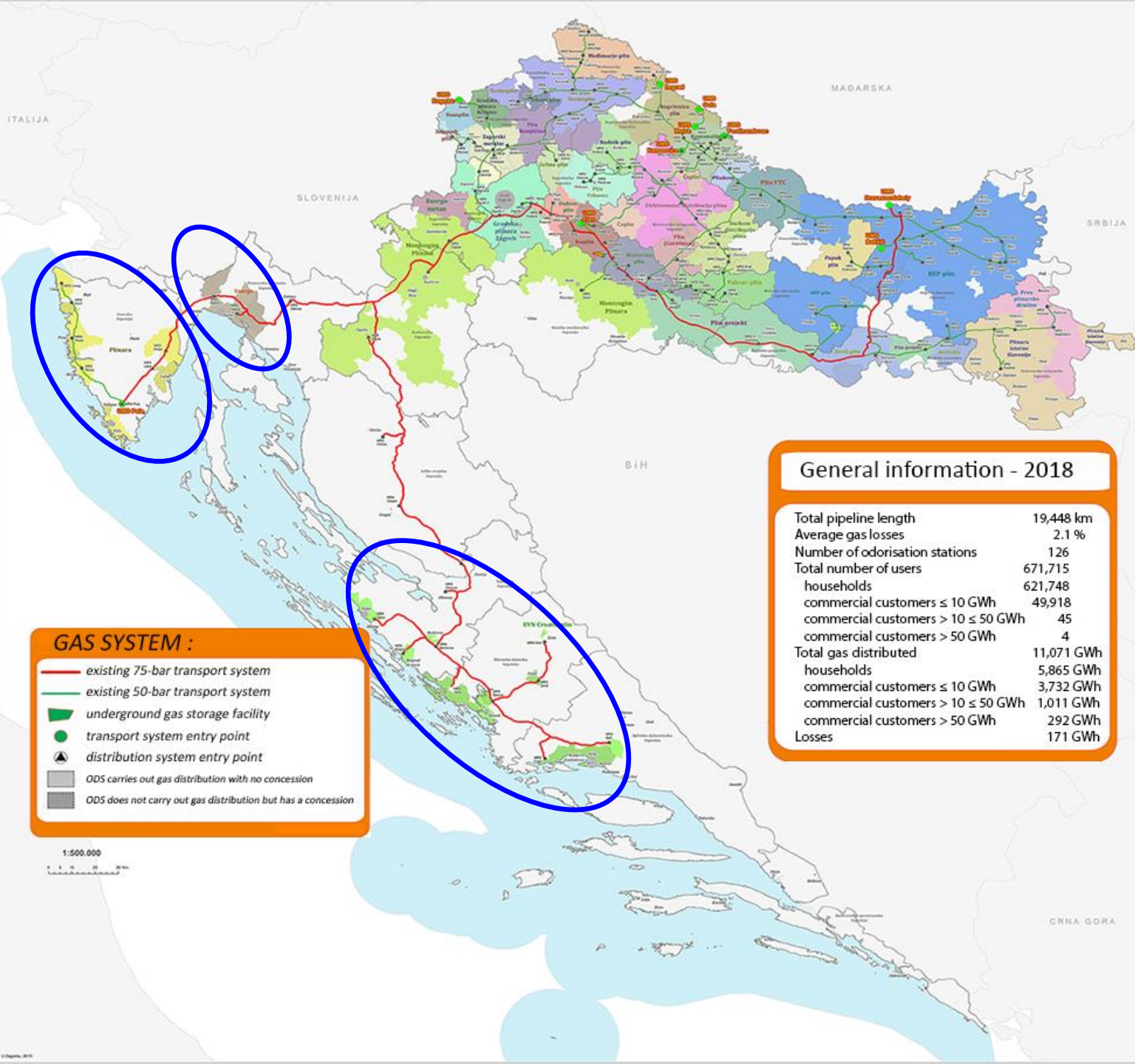


# Natural gas system of Croatia - the state of play

- ❑ significant transmission capacity and interconnections with neighboring countries
- ❑ significant number of relatively small DSOs with different level of development



- ❑ upgrading the system for domestic purposes and for transit use - connecting with new supply projects
- ❑ **gasification of new uncovered areas in southern Croatia**





## New gas tariff methodology in Croatia - 2013

- Consistent methodological basis of gas infrastructure regulation
  - ❑ Economic regulation since 2001 had been solely based on the Rate-of-return method
  - ❑ Upgrade to **incentive-based** tariffing
- Review the position of **investors** in gas grids, storage, LNG terminal
  - ❑ Difficulties related to existing methodology – in particular to the one-year regulatory period
  - ❑ Particular position of GREENFIELD investors
- Taking into account trends in international (EU) regulation and experience gained by HERA, together with changes of legal framework and gasification of southern Croatia
- Main goals of the new regulation:
  - ❑ to increase **efficiency** and **productivity** as well as adequate **financial capacity** of regulated entities
  - ❑ to provide **regulatory incentives** for investing into new gas infrastructure and incremental capacity
- the applied incentives minimise the price spread and consequently enable new supplies -> make gas **more affordable**



# Overview of gas market activities in Croatia

ENERGY ACTIVITY	OPERATOR	ENERGY SUBJECT	TARIFF METHODOLOGY	REGULATORY PERIOD	METHOD OF ECONOMIC REGULATION
<b>REGULATED ACTIVITIES</b>					
GAS TRANSMISSION	TSO	PLINACRO Ltd.	<i>Methodology for the determination of the tariff items for Gas Transmission (OG No. 48/18, 58/18)</i>	<b>2. reg. period</b> <b>1.1.2017. – 31.12.2021.</b>	REVENUE CAP
GAS STORAGE	SSO	PODZEMNO SKLADIŠTE PLINA Ltd.	<i>Methodology for the determination of the tariff items for Gas Storage (OG No. 48/18)</i>	<b>2. reg. period</b> <b>1.1.2017. – 31.12.2021.</b>	REVENUE CAP
GAS DISTRIBUTION	DSO	35	<i>Methodology for the determination of the tariff items for Gas Distribution (OG No. 48/18)</i>	<b>2. reg. period</b> <b>1.1.2017. – 31.12.2021.</b>	REVENUE CAP
LNG SYSTEM OPERATION	LNGSO	LNG HRVATSKA Ltd.	<i>Methodology for the determination of the tariff items for the Unloading and Send Out of LNG (OG No. 48/18)</i>	-	REVENUE CAP
PUBLIC SERVICE OF GAS SUPPLY	SUPPLIER UNDER PUBLIC SERVICE OBLIGATION, LAST RESORT SUPPLIER	34	<i>Methodology for the determination of the tariff items for the Public Service of Gas Supply and the Supply of Last Resort (OG No. 34/18)</i>	-	COST-PLUS
GAS MARKET ORGANISATION	GAS MARKET OPERATOR	HROTE Ltd.	NO <i>(operator's fee determined on the basis of cost-plus principle)</i>	-	COST-PLUS
<b>MARKET ACTIVITIES</b>					
NATURAL GAS PRODUCTION	NATURAL GAS PRODUCER	INA d.d.	-	-	-
GAS TRADE	GAS TRADER	12	-	-	-
GAS SUPPLY	GAS SUPPLIER	53	-	-	-





# Tariff methodology - key features

- TSO/SSO/DSO/LNGSO methodologies – separate subordinate legislation -> the same AR method
- based on the **building blocks approach** -> **revenue cap** method
  - OPEX - **incentive regulation** scheme
  - CAPEX – **rate of return** scheme
- OPEX incentive regulation - conducted by the **efficiency factor** and the **profit sharing mechanism**
- CAPEX remuneration scheme - **ex-ante RAB approval** based on investment plan **with ex-post adjustment** based on realised values (up to the economically efficient level)
- duration of reg. period – 1<sup>st</sup> period 3 years (2014-16), 2<sup>nd</sup> and subsequent periods **5 years** (2017-21)
- allowed revenues and tariffs amounts set for all the years of the regulatory period before beginning of the regulatory period (in year T-1) => **allowed revenue smoothing** throughout the reg. period
- revision of allowed revenues carried out in the last year of the regulatory period
  - mechanism for **switching the difference (reconciliation)** between allowed and incurred revenues (under- or over-recovery) to the years of the next regulatory period with its future values (indexed by WACC)
- extraordinary revision of allowed revenues due to unexpected changes in the market - at the request of the operator or according to HERA decision => possible to revise all elements used in the projection of allowed revenues, except the efficiency factor



## Allowed revenues - structure

- AR determined on the basis of the eligible costs and an appropriate return on regulated assets
- revenues from non-standard services and other generated revenues are deducted items

$$DP_t^P = OPEX_t^P + A_t^P + PRO_t^P + PV\delta_t - (P_{NU}^P + P_{OST}^P)$$





## Operating expenditure (1)

- all **justifiable** operational costs related to energy activity, consisting of reasonable amount of material costs, cost of service, personnel costs and other operating expenses (unjustifiable operational costs defined)
- OPEX projection for the years the reg. period based on the determined value of the **base OPEX** for the year T-2 (the last year of available fin. reports at the time of determining the tariff) and the estimated amount of the **CPI** and the determined amount of the **X factor**

$$OPEX^P_{T+i-1} = OPEX^P_{T+i-2} \times (1 + CPI^P_{T+i-1} - X); \quad i=2,3,4,5$$

- setting the base OPEX:

$$OPEX^{DOZ}_{T-2} = \min [OPEX_{T-2}, OPEX_{T-2} - 0,5 \times (OPEX_{T-2} - OPEX^{TSO}_{T-2})]$$

wherein the following items are:

- $OPEX^{DOZ}_{T-2}$  - the allowed base OPEX in the year T-2
- $OPEX_{T-2}$  - previously projected OPEX for the year T-2
- $OPEX^{TSO}_{T-2}$  - realised amount of OPEX in the year T-2





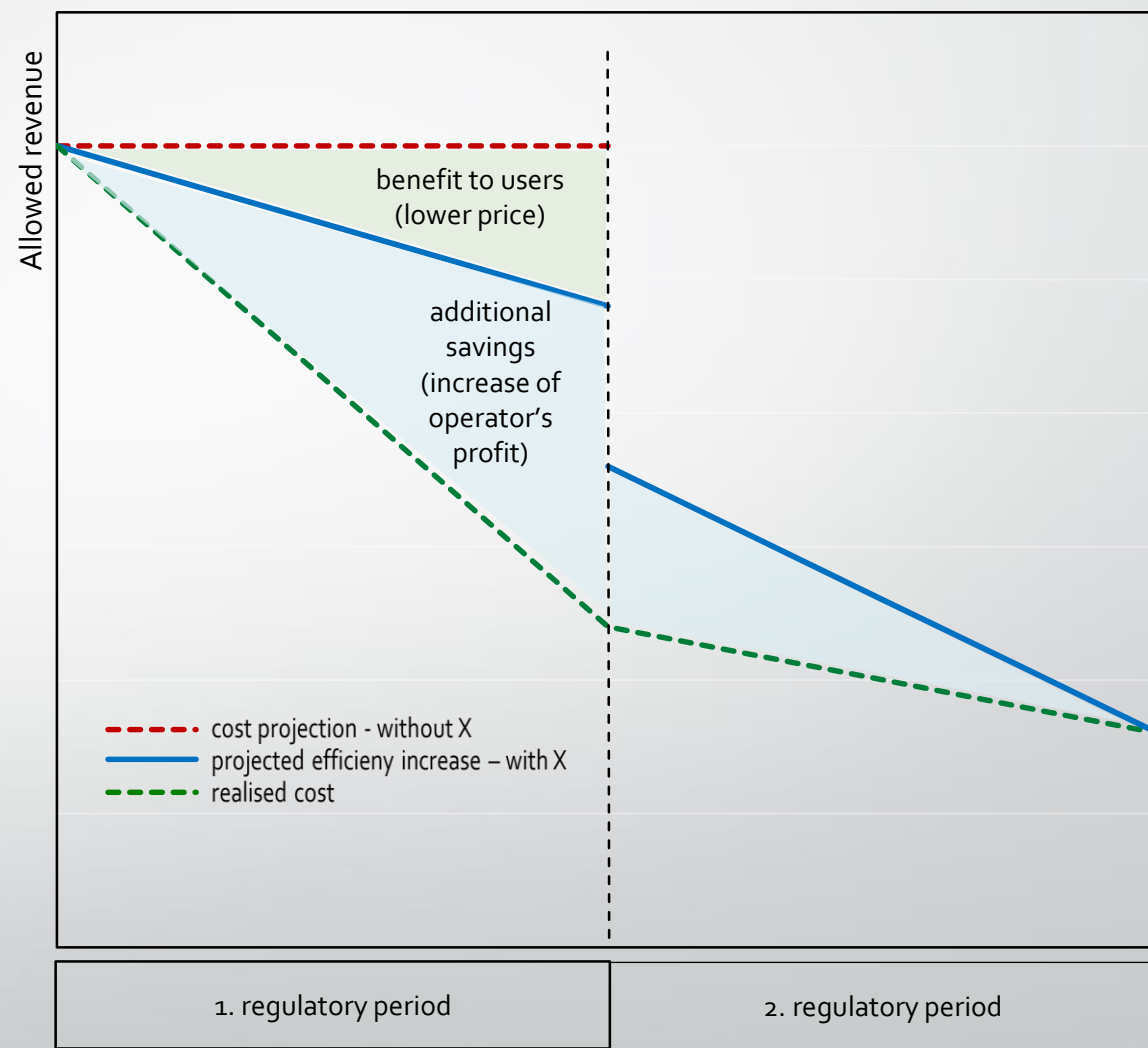
# Operating expenditure

## ➤ *efficiency factor X:*

- reflects the expected increase in efficiency => establishing appropriate incentives for ex-ante efficiency increase => with limited revenue / tariffs growth operator will strive to maintain the level of profits by increasing operational savings
- application of some of the recognized benchmark method for determining the efficiency of each DSO relative to sector postponed for 2<sup>nd</sup> reg. period - with planned application starting from 3<sup>rd</sup> reg. period
- simplified uni-dimensional benchmark method used in 2013 (DSO) -> comprehensive analysis to determine the base OPEX for 1<sup>st</sup> reg. period

## ➤ *profit sharing mechanism:*

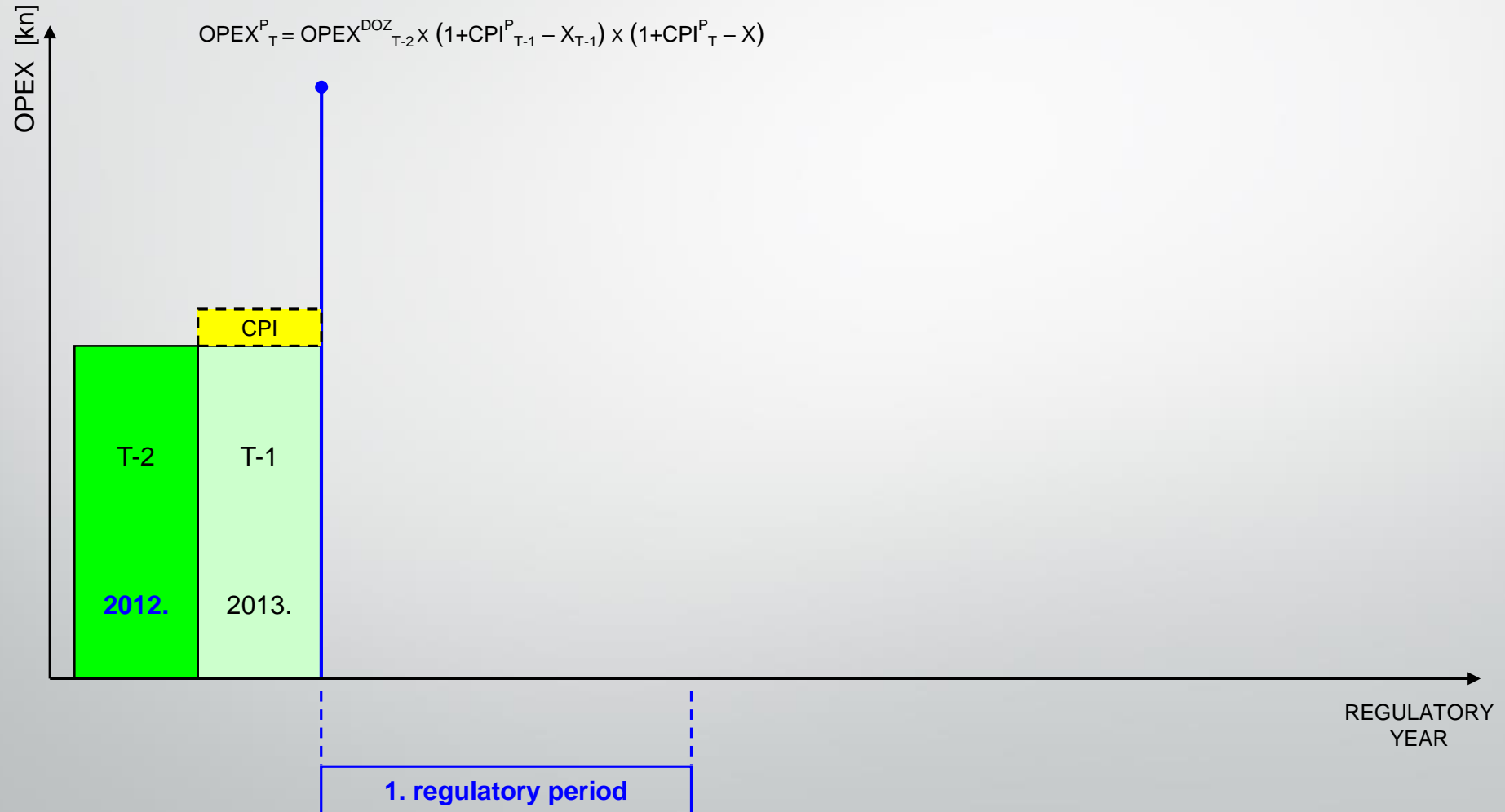
- sharing 50% of achieved savings with customers (lower OPEX)
- no OPEX increase in case of inefficiency
- applied for setting base OPEX for 2<sup>nd</sup> reg. period





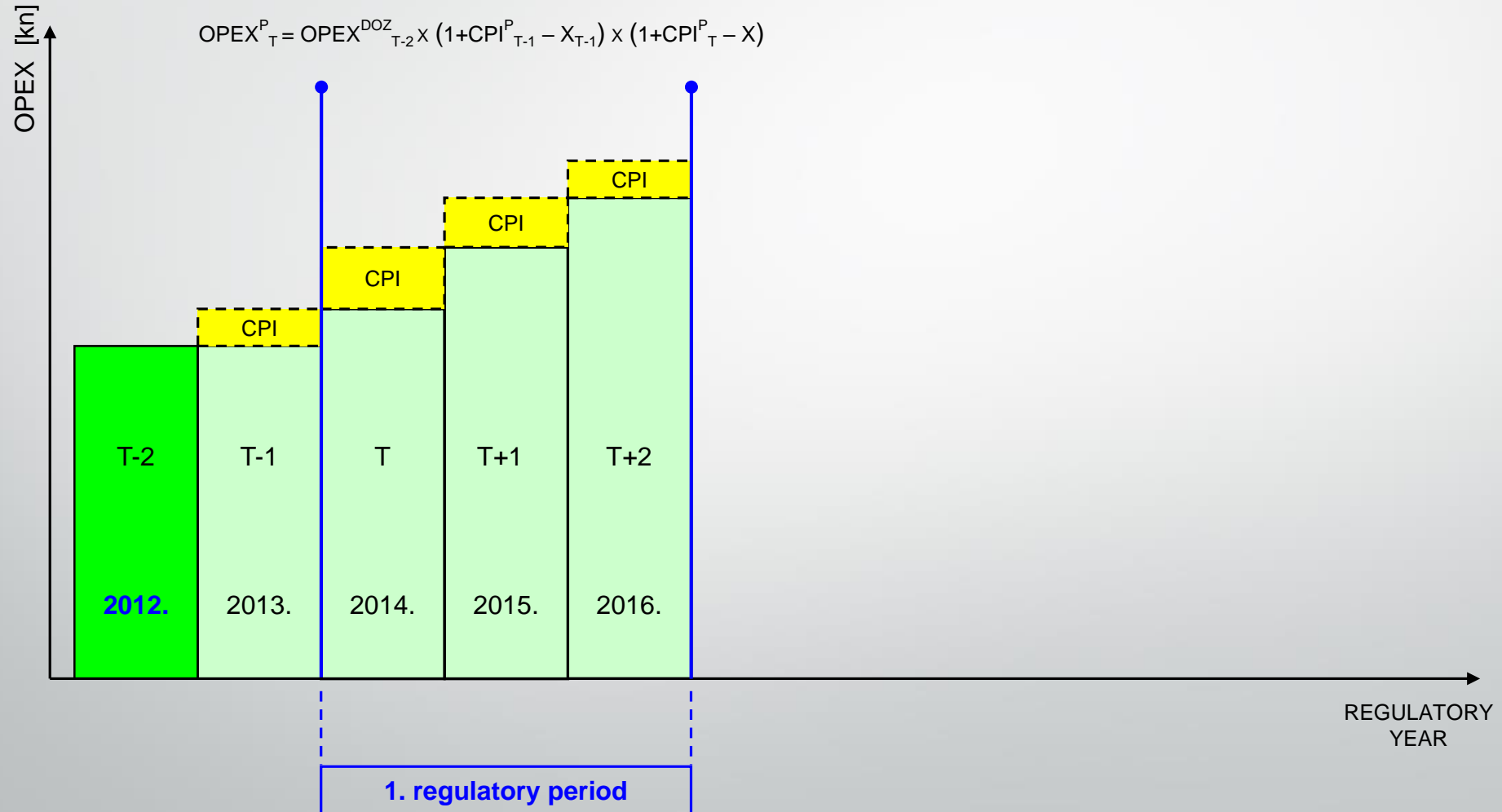


# OPEX projection / profit-sharing



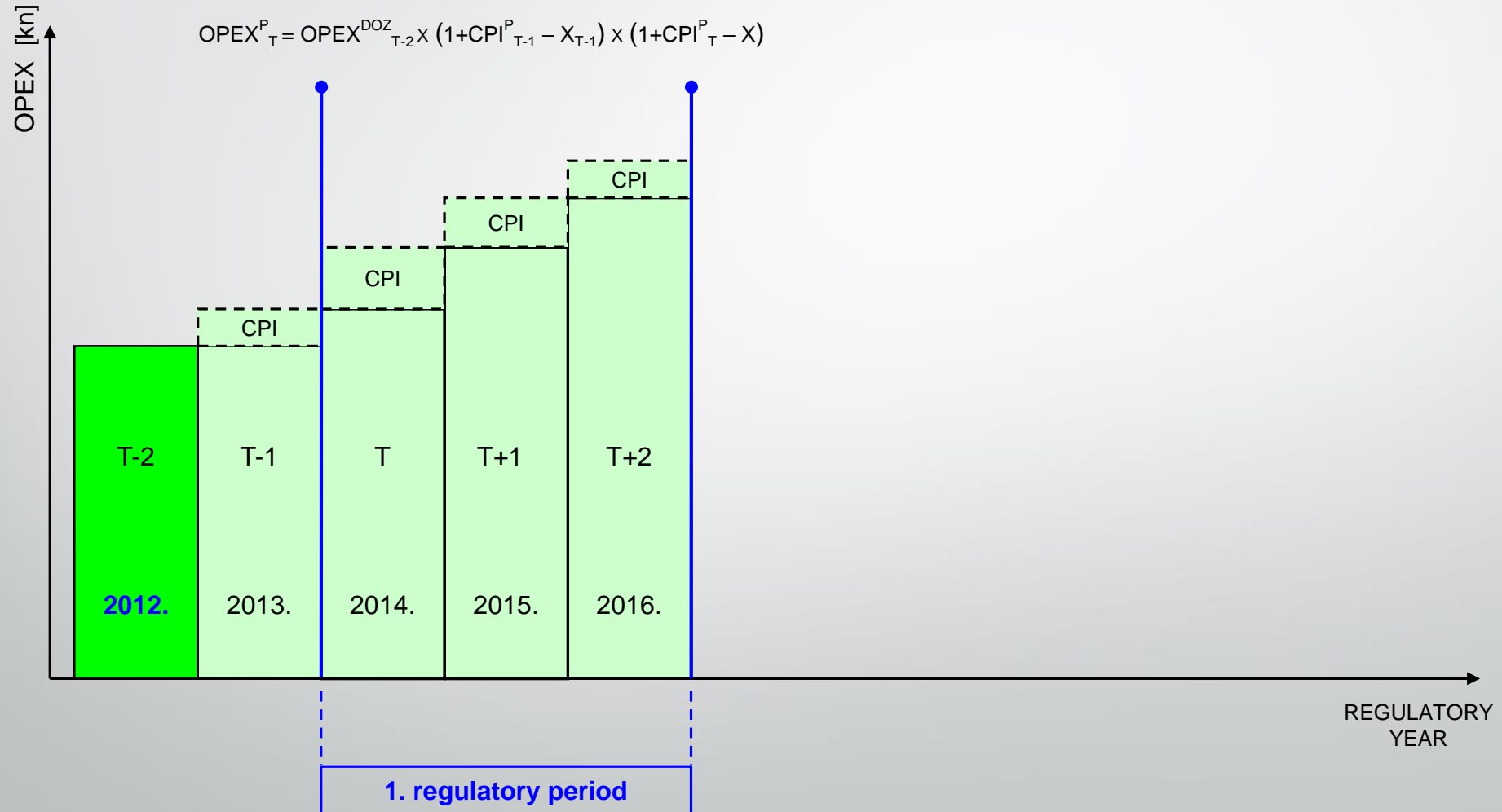


# OPEX projection / profit-sharing



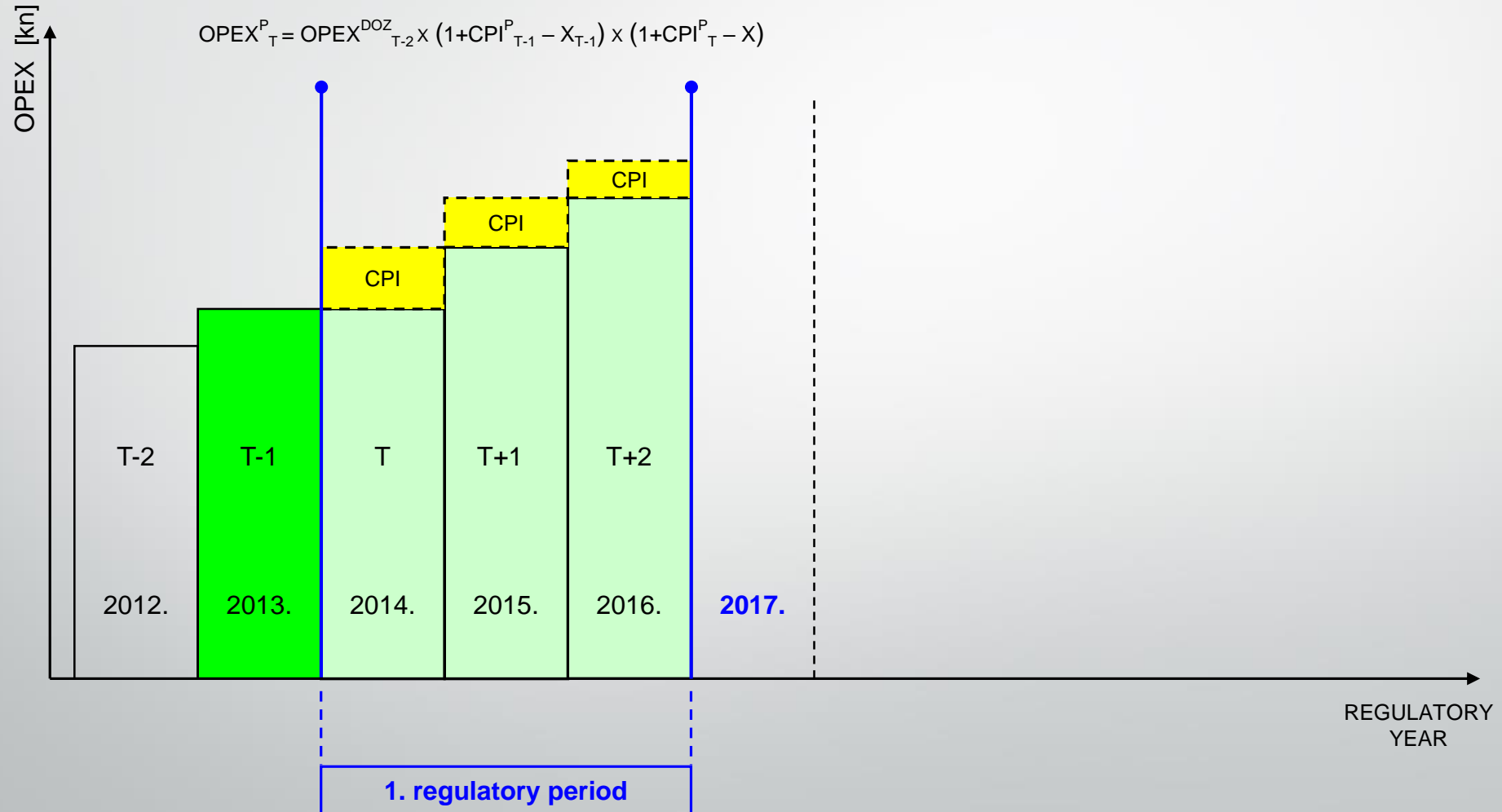


# OPEX projection / profit-sharing





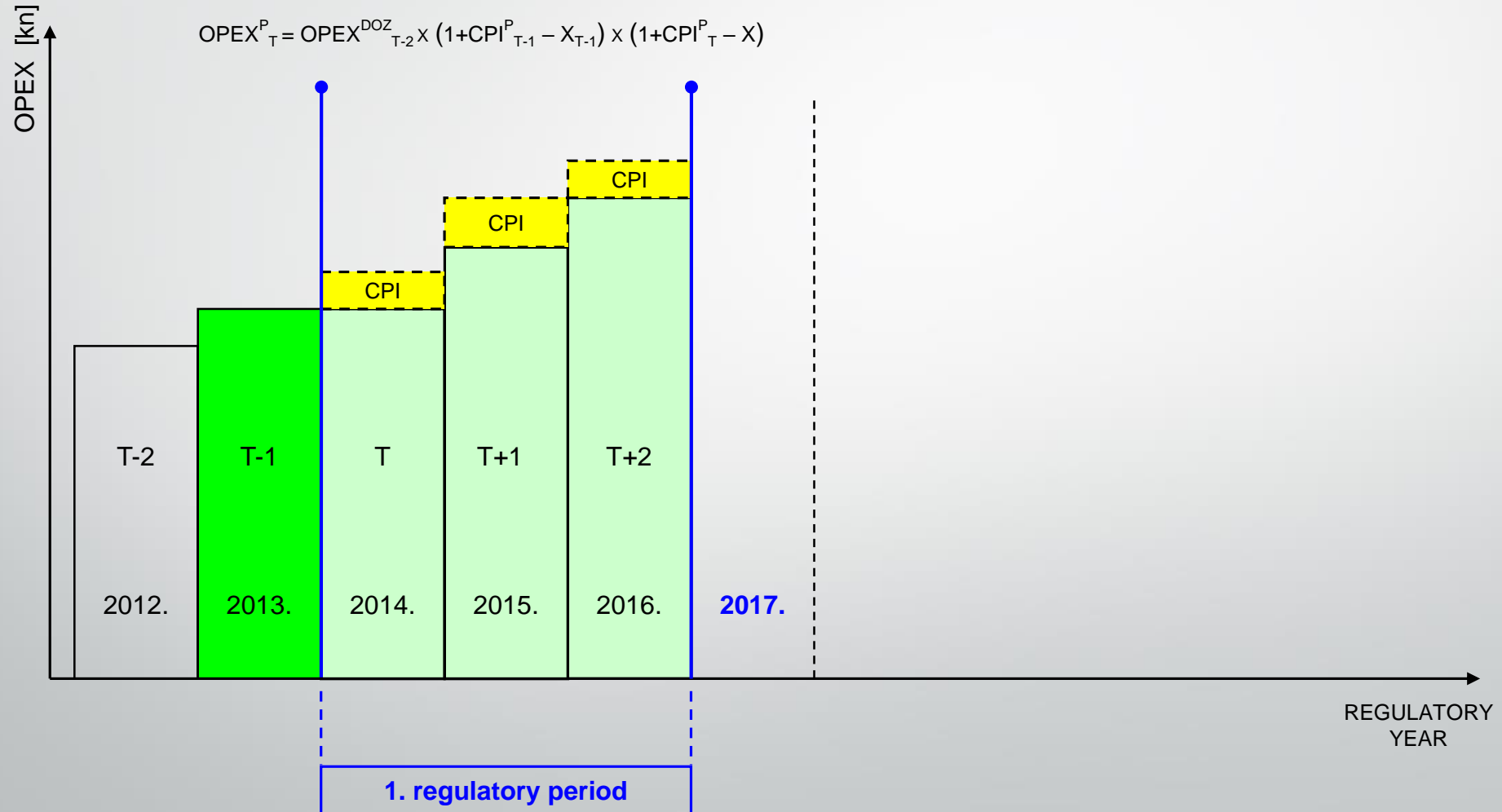
# OPEX projection / profit-sharing





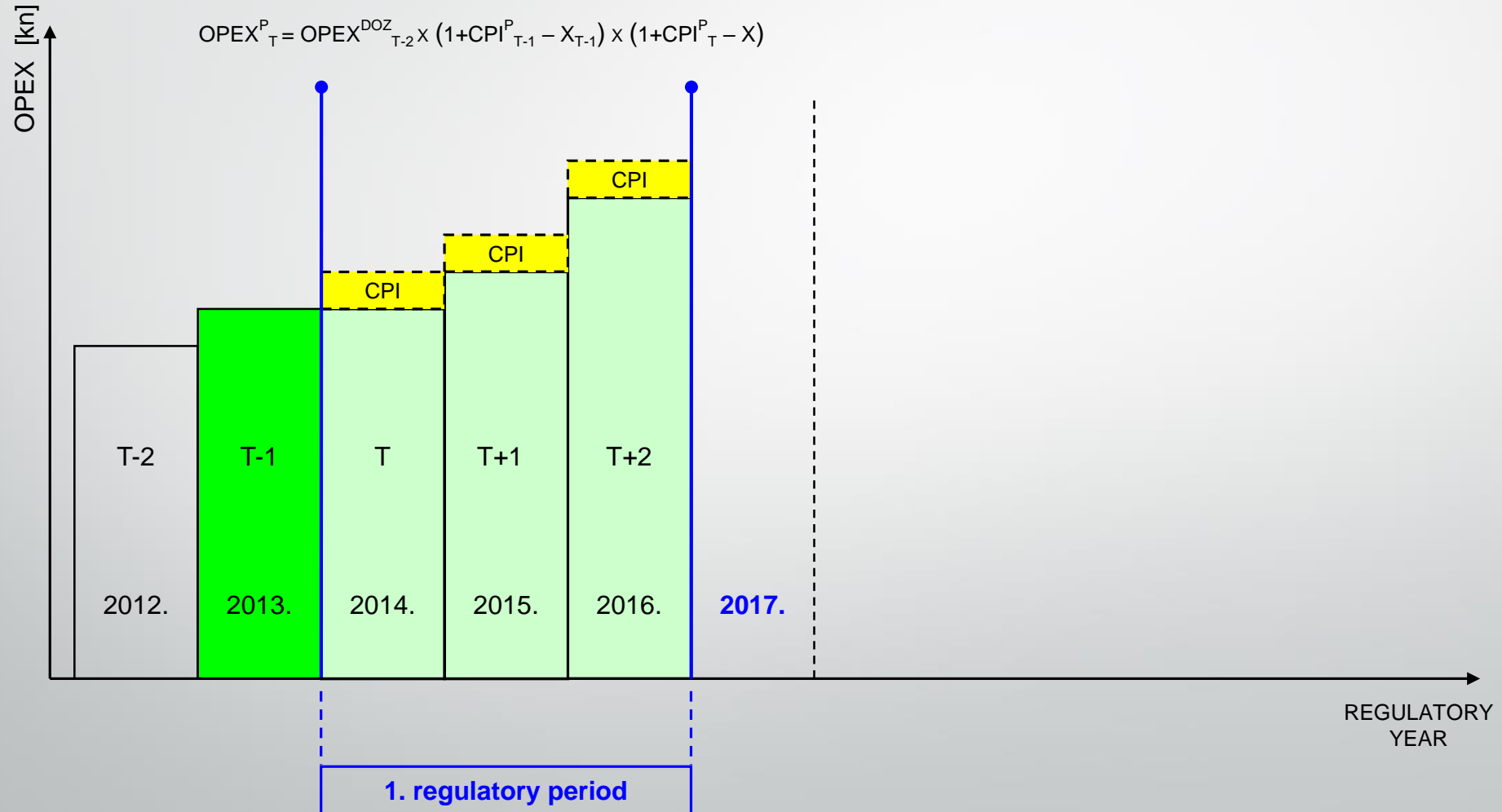


# OPEX projection / profit-sharing



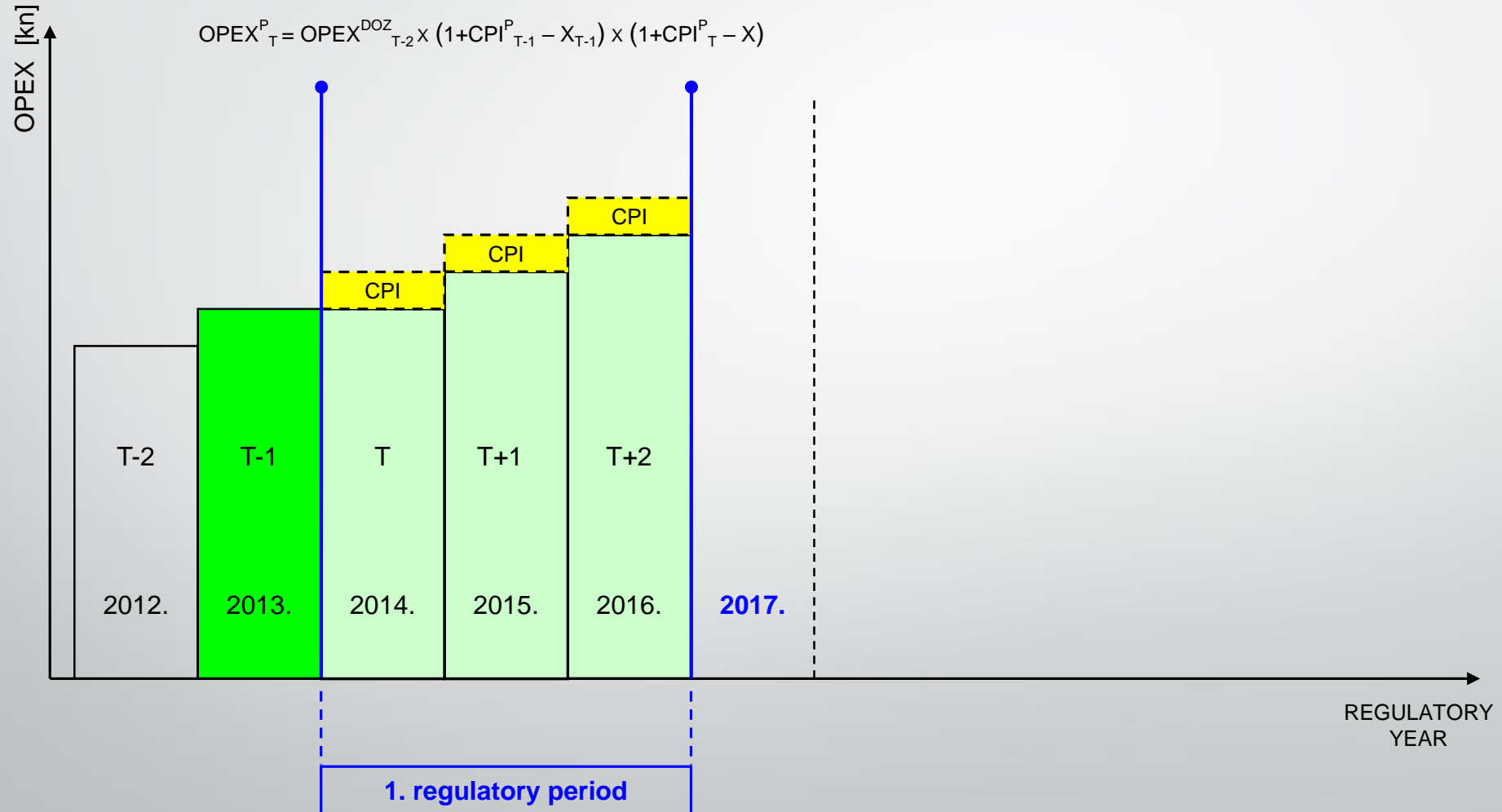


# OPEX projection / profit-sharing



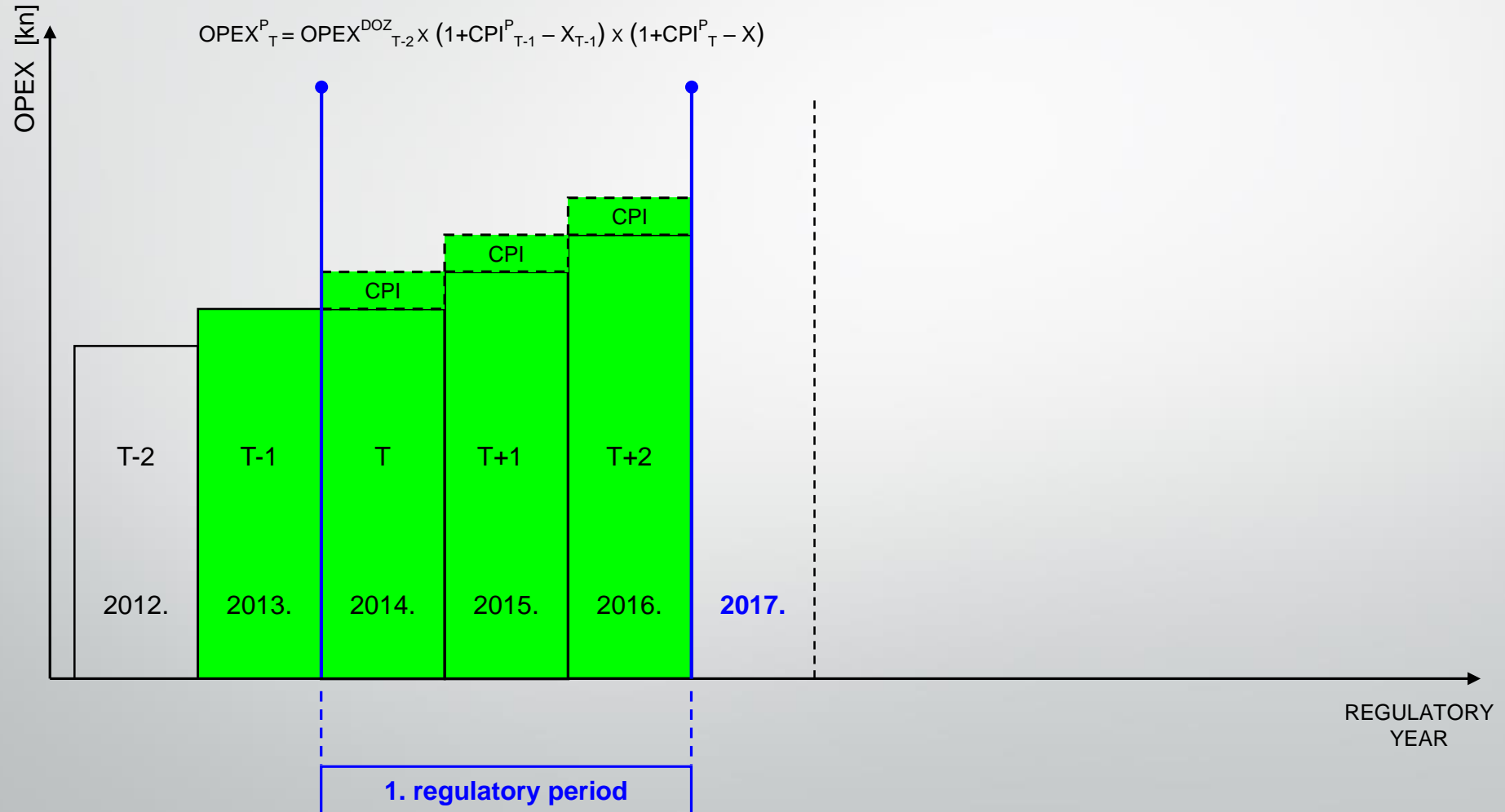


# OPEX projection / profit-sharing





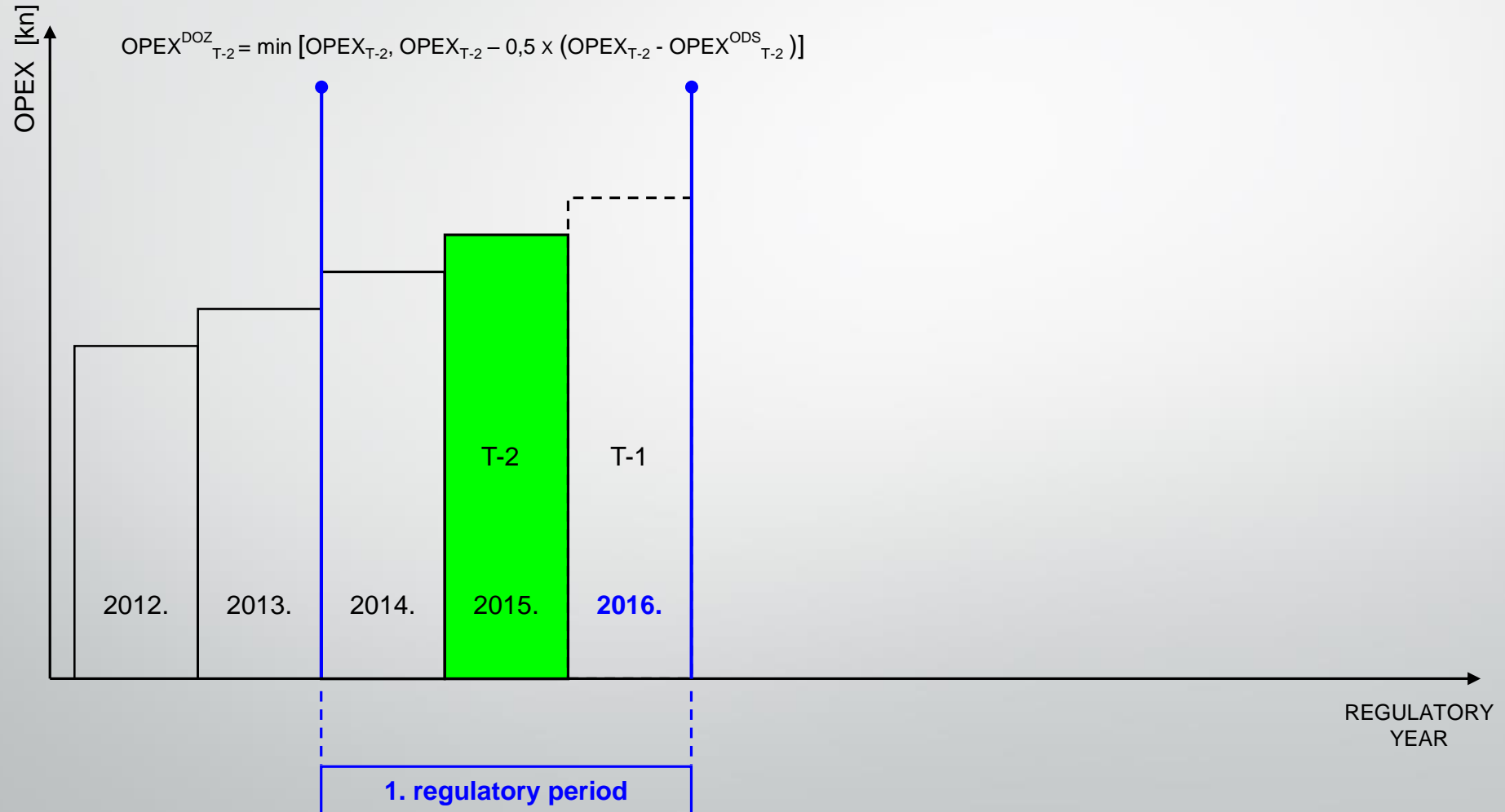
# OPEX projection / profit-sharing





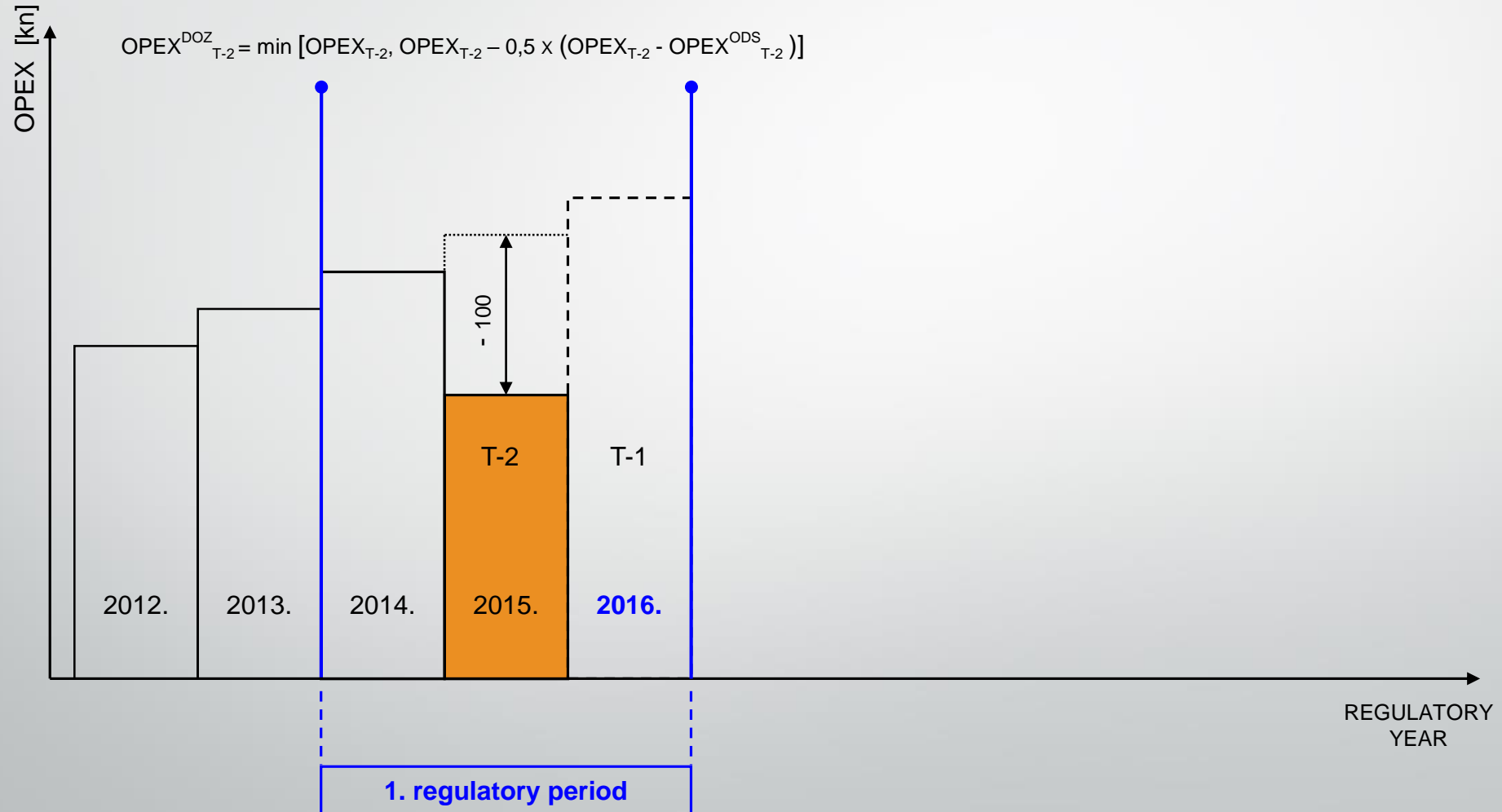


# OPEX projection / profit-sharing



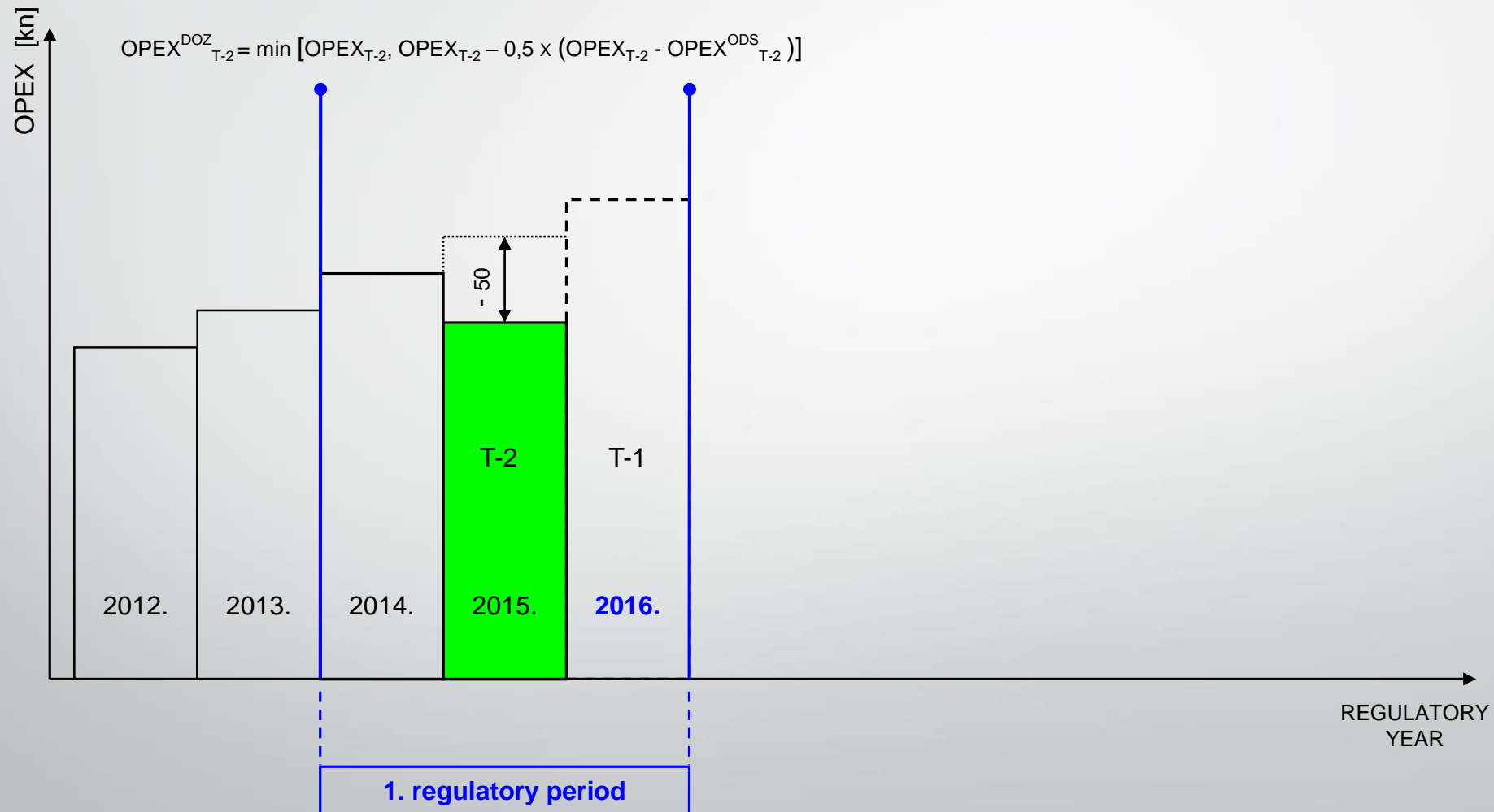


# OPEX projection / profit-sharing



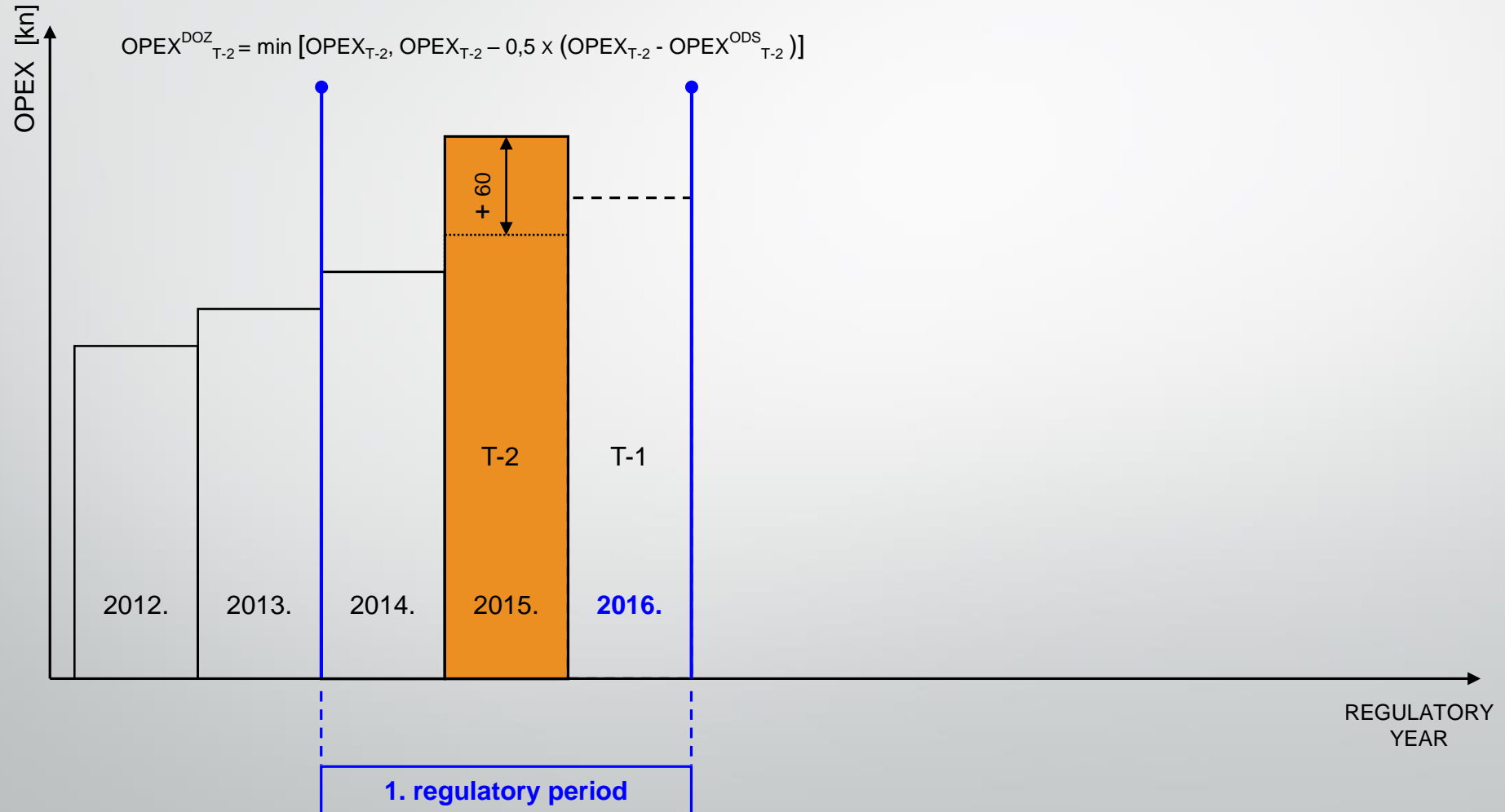


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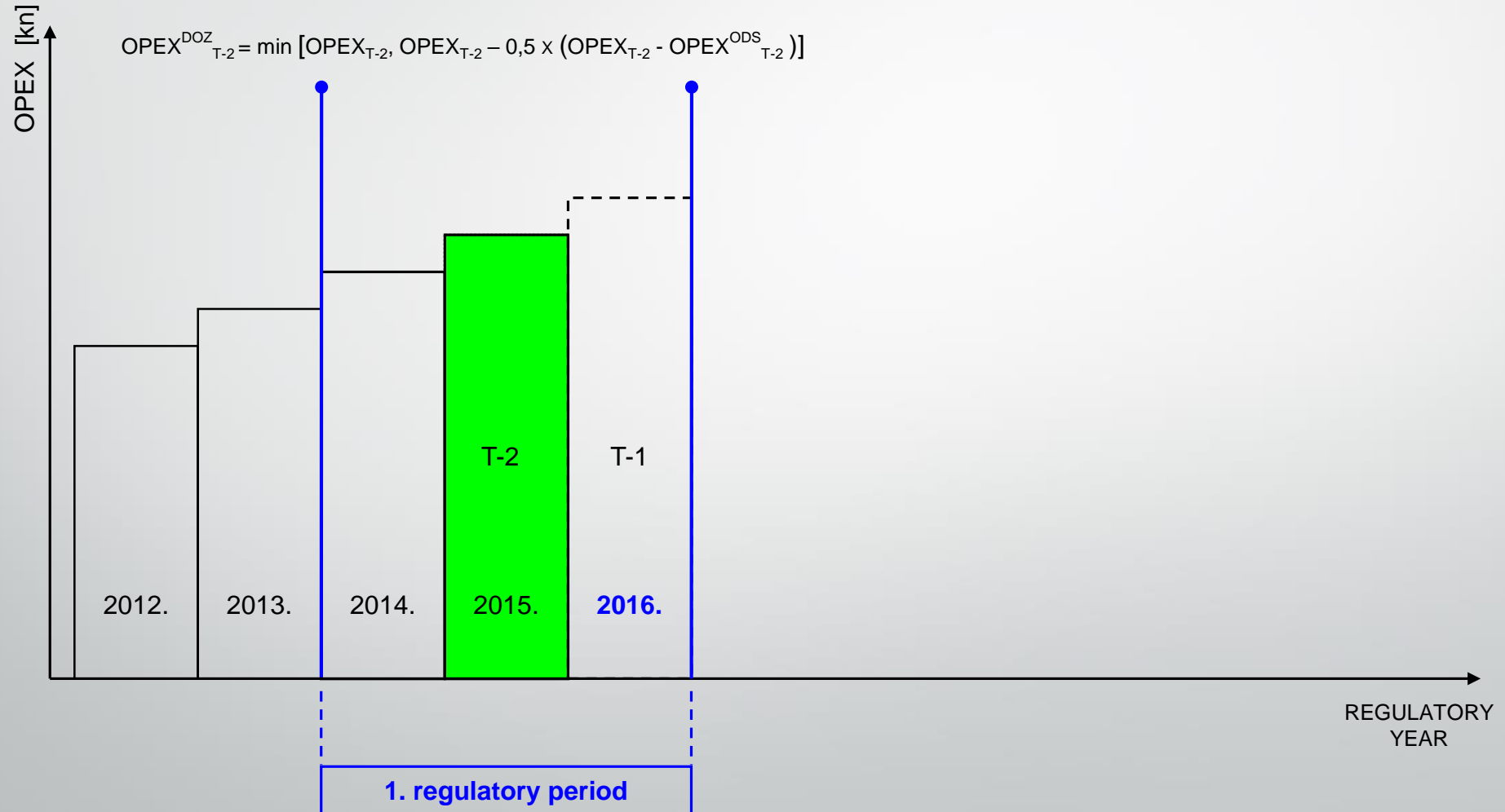


# OPEX projection / profit-sharing



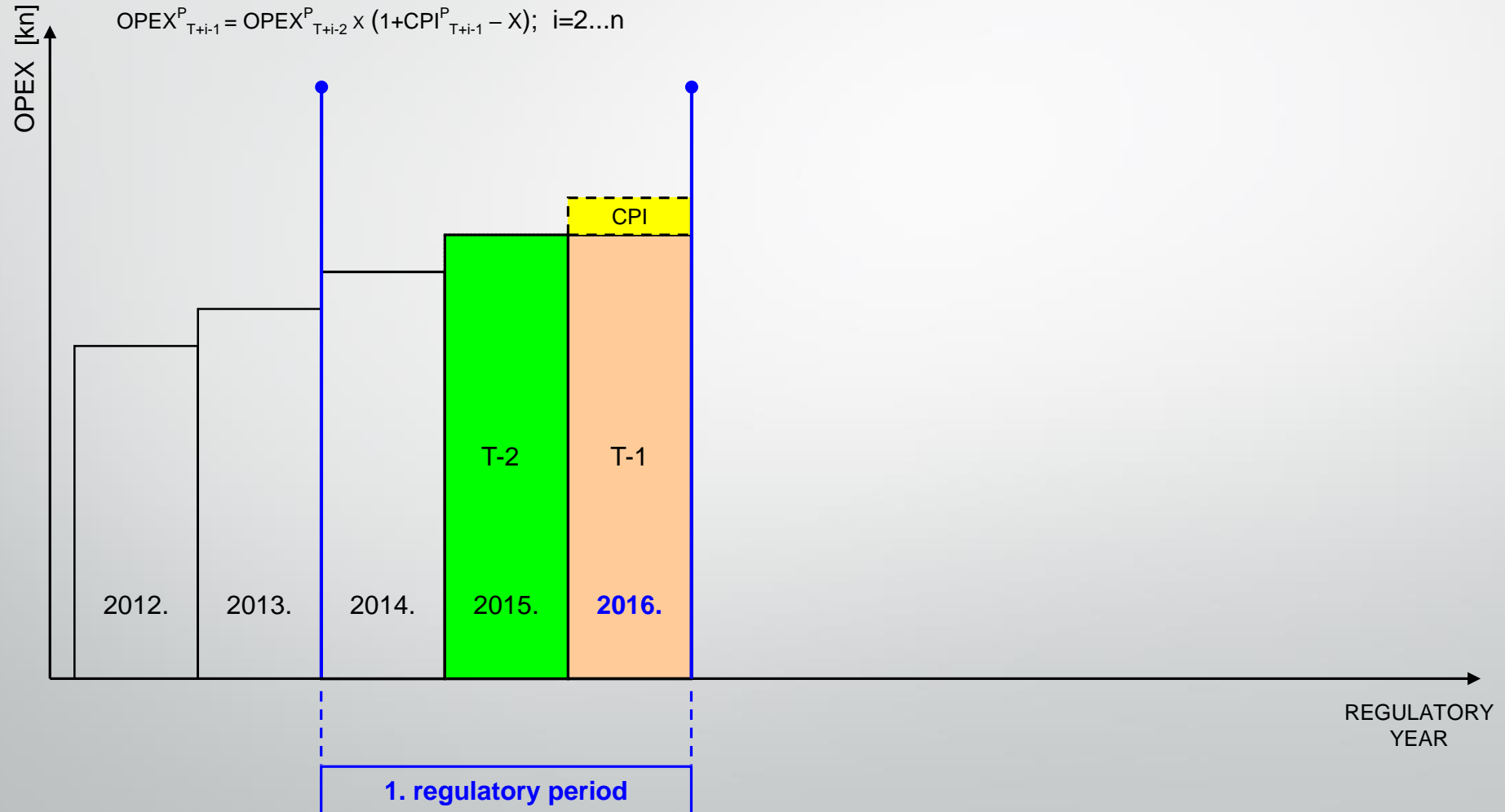


# OPEX projection / profit-sharing





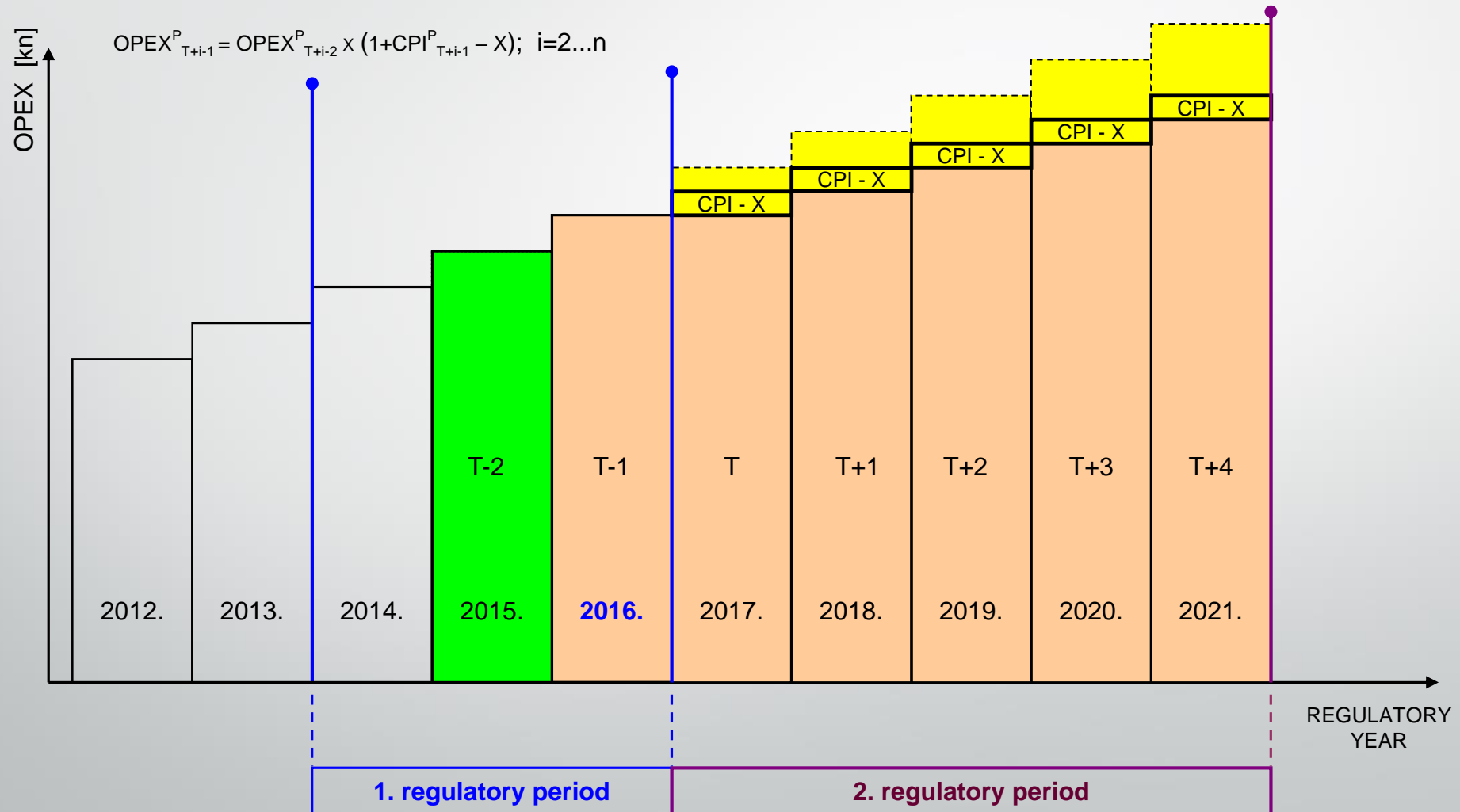
# OPEX projection / profit-sharing





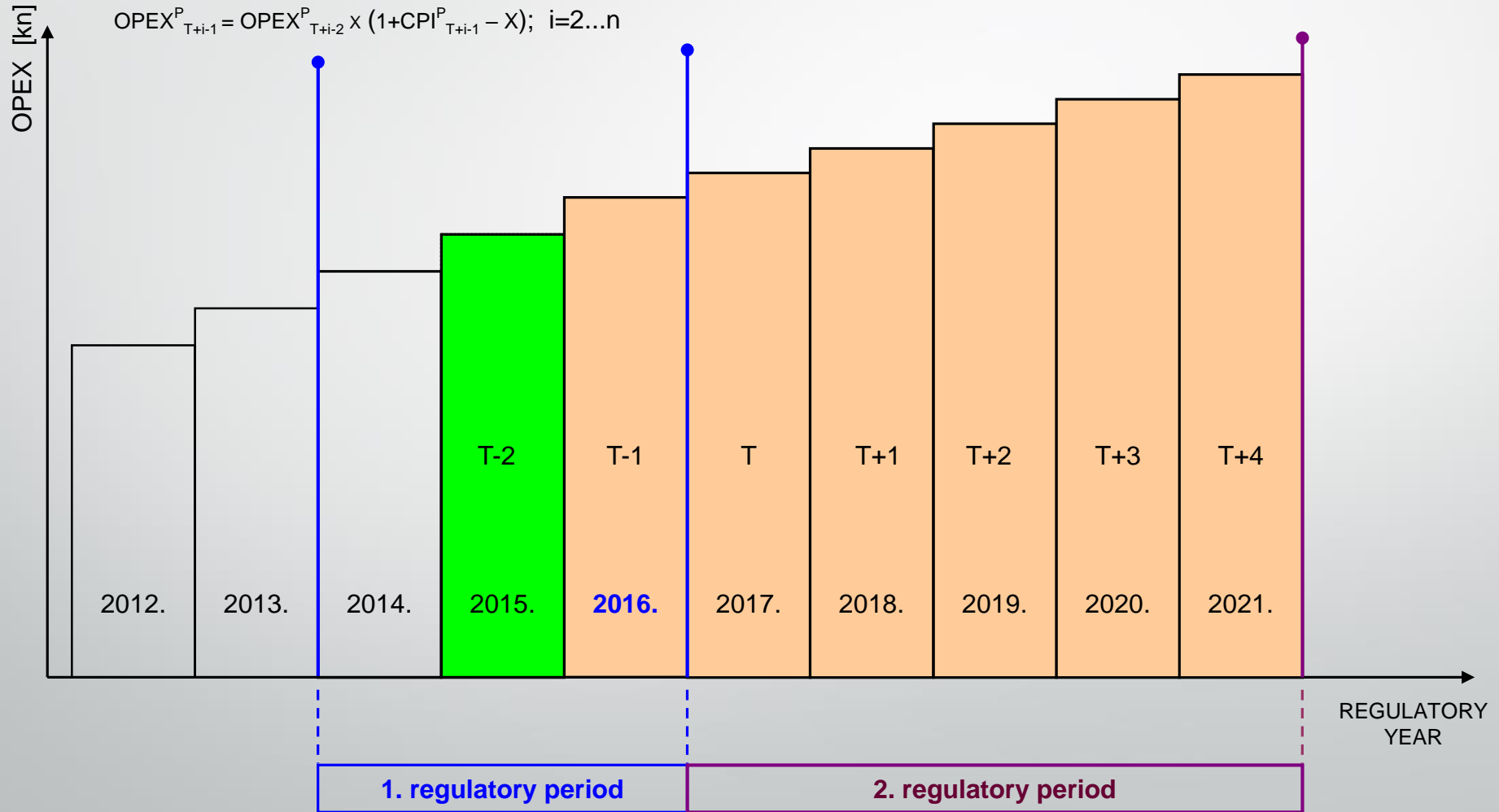


# OPEX projection / profit-sharing





# OPEX projection / profit-sharing





# Capital expenditure

## ➤ RAB:

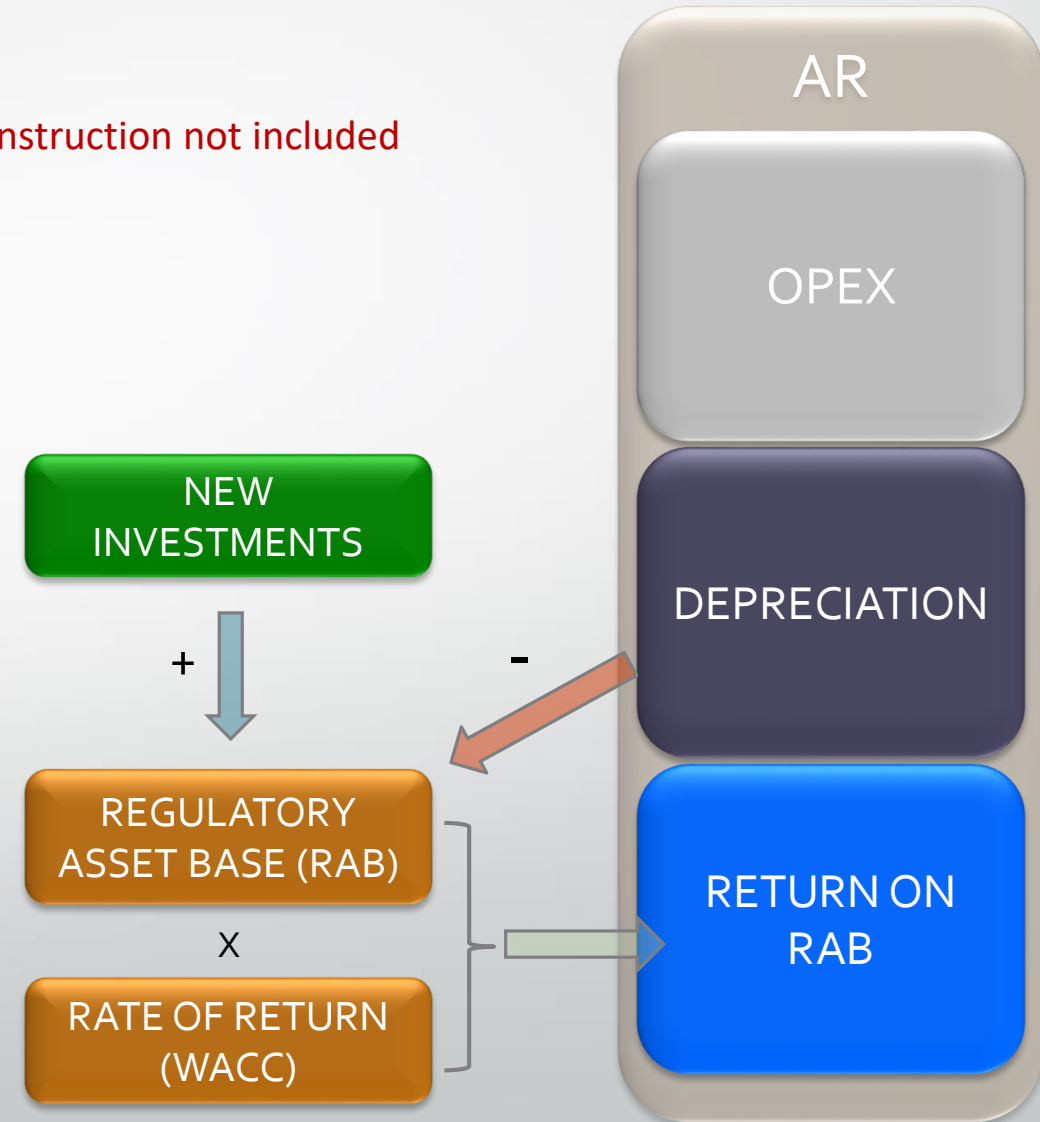
- regulated assets - **tangible and intangible** assets
- based on **net book value**
- only assets in service considered, assets in **preparation/construction not included**
- non-repayable funds and subsidies deducted from RAB
- projected for all years of the regulatory period in T-1 year

## ➤ new investments:

- added to projection of RAB -> based on **approved network development plan** (approved before reg. period)
- investments should be technically **justified and economically efficient** -> HERA performs evaluation of submitted investments by benchmark. other projects and by analyzing a feasibility study / CBA
- *ex-ante* approval of investment plan with *ex-post* review of justifiability and efficiency (part of AR revision)

## ➤ depreciation - maximum allowable depreciation rates:

- 2,86 % max (35 years minimum asset life) for pipelines, MRS, buildings (TSO, SSO, DSO) / 40 years for LNGSO
- 5 % max (20 years minimum asset life) -> for plants and equipment (SSO and LNGSO)
- possibility of applying progressive method of depreciation calculation (in regulatory account option)





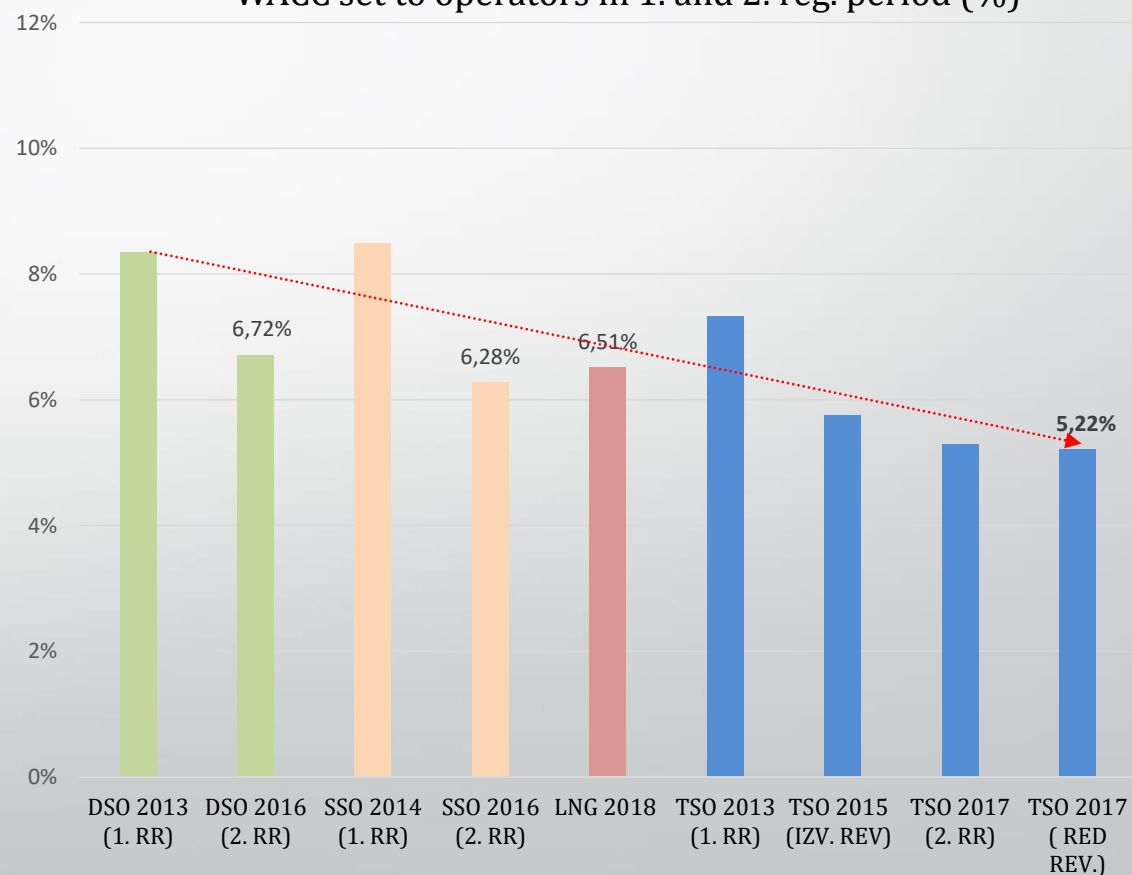
## WACC - nominal pre-tax

- ✓ D/E ratio fixed to 50/50 % - target shares in the capital structure
- ✓ **rate of return on equity** ( $r_e$ ) determined by applying the capital asset pricing model (CAPM)
- ✓ **risk free rate** ( $r_f$ ) determined based on the average value of nominal interest rate of the latest three ten-year domestic or international bonds issued by the Cro Gov
- ✓ **variability coefficient** ( $\beta$ ) reflects the degree of risk of investing in the energy business of gas distribution in relation to the risk of investing in the market, can be determined on the basis of a comparative analysis of the variability coefficients of return on the shares of the similar operators applied in the regulatory mechanisms of European countries
- ✓ **market risk premium** ( $r_m - r_f$ ) reflects the expected rate of return on the diversified market portfolio in Croatia, determined based on benchmark analysis and available international databases
- ✓ **rate of return on debt** ( $r_d$ ) equals the weighted average interest rate on investment loans used by the operator to finance regulated assets, whereby the interest rate on investment loans are taken into account up to the maximum reference interest rate -> the average interest rate of credit institutions on long-term loans in Croatian kuna with a foreign currency clause granted to non-financial companies in Croatia in the last 12 months

$$WACC = \frac{r_e}{1-P} \times \frac{E}{E+D} + r_d \times \frac{D}{E+D}$$

$$r_e = r_f + \beta \times (r_m - r_f)$$

WACC set to operators in 1. and 2. reg. period (%)





## Allowed revenue **allocation - Tariff items**

- **Ts1** (kn/kWh) - tariff item for the distributed gas quantity
- **Ts2** (kn) - fixed monthly fee for covering the corresponding part of fixed expenses of gas distribution related to a metering point:
  - ✓ maintenance, replacement and calibration of gas meters,
  - ✓ measurement, transfer and processing of measurement data
  - ✓ other related costs



## Gas distribution tariff methodology – tariff models

Tariff model	BMP (billing metering point) yearly consumption - Q (kWh)
TM <sub>1</sub>	$Q \leq 5.000$ kWh
TM <sub>2</sub>	$5.000 < Q \leq 25.000$
TM <sub>3</sub>	$25.000 < Q \leq 50.000$
TM <sub>4</sub>	$50.000 < Q \leq 100.000$
TM <sub>5</sub>	$100.000 < Q \leq 1.000.000$
TM <sub>6</sub>	$1.000.000 < Q \leq 2.500.000$
TM <sub>7</sub>	$2.500.000 < Q \leq 5.000.000$
TM <sub>8</sub>	$5.000.000 < Q \leq 10.000.000$
TM <sub>9</sub>	$10.000.000 < Q \leq 25.000.000$
TM <sub>10</sub>	$25.000.000 < Q \leq 50.000.000$
TM <sub>11</sub>	$50.000.000 < Q \leq 100.000.000$
TM <sub>12</sub>	$Q \geq 100.000.000$



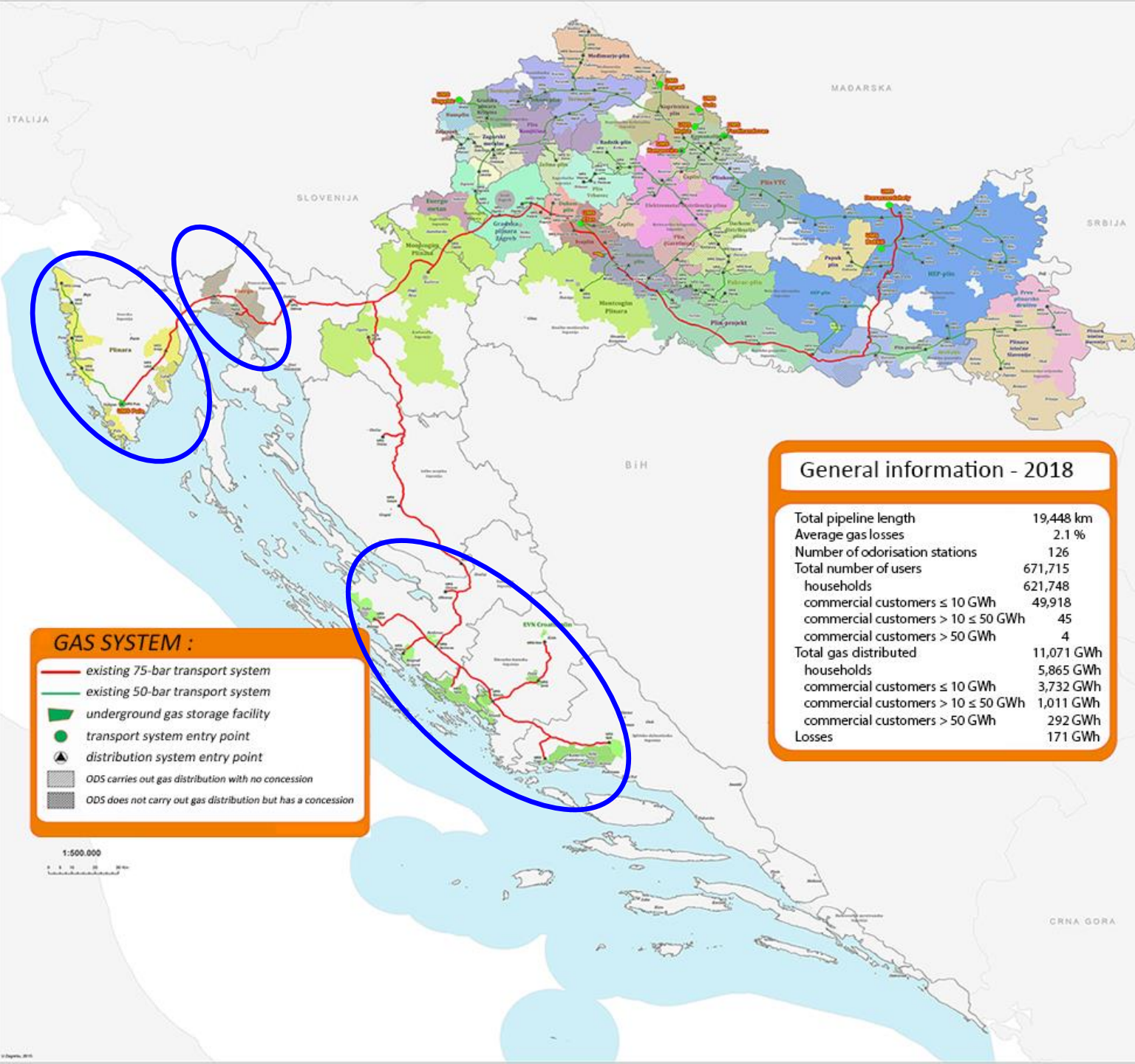


## Gas distribution tariff methodology – tariff allocation

Tariff model	Coefficient of consumption - $k_{P, TMi}$	Coefficient of billing metering point - $k_{OMM, TMi}$
TM1	1,00 – 1,30	1,0
TM2	1,00	1,0
TM3	0,80 – 1,00	2,0
TM4	0,75 – 0,95	3,0
TM5	0,70 – 0,90	4,0
TM6	0,65 – 0,85	6,0
TM7	0,60 – 0,80	10,0
TM8	0,55 – 0,75	15,0
TM9	0,40 – 0,70	20,0
TM10	0,30 – 0,60	30,0
TM11	0,20 – 0,50	40,0
TM12	0,10 – 0,40	50,0

## Challenges in natural gas distribution sector

- gasification and development of distribution grids in **new concession areas** in coastal parts of Croatia (Istria and Dalmatia)
- represent significant greenfield investments in gas distribution grids:
  - ❑ steep growth of the regulated asset base
  - ❑ initially low gas volumes (small number of customers)
    - results in **uncompetitively HIGH TARIFFS**
- Imperative to **prolong the regulatory period** - redesigning the basic tariff methodology
- Providing a **special option** for sustainable grid investments





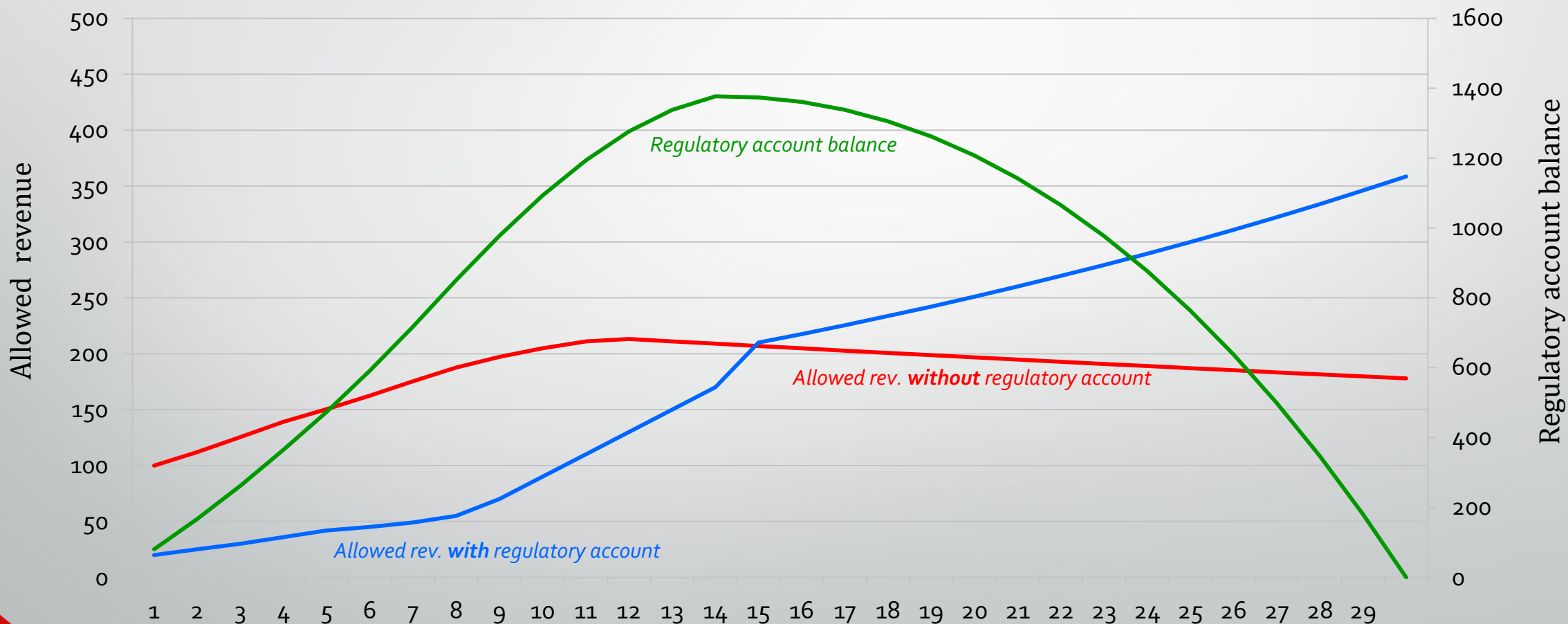
## Regulatory account – the new method

- **optional model** of incentive regulation of infrastructure activities in HR gas sector -> approved by HERA
- application of the regulatory account resulting in objective and methodologically consistent tariffs -> **longer regulatory period** (min. 10 years)
- introduced option of regulatory account → **supporting investments** in new infrastructure
- **prerequisites** for regulatory account set up:
  - **significant investments** in the next regulatory period,
  - expected gas system usage in next reg. period much lower than in subsequent periods,
  - **resulting tariffs without reg. account not competitive** (to competing fuels in case of distribution, or to neighbouring countries' storage systems or LNG terminals) -> in case of significant investments, without an option of “regulatory account”, complete investment, when put in service, would go into regulatory base, which would result in uncompetitively high tariffs during the initial years, when high investments are being followed with low gas consumption



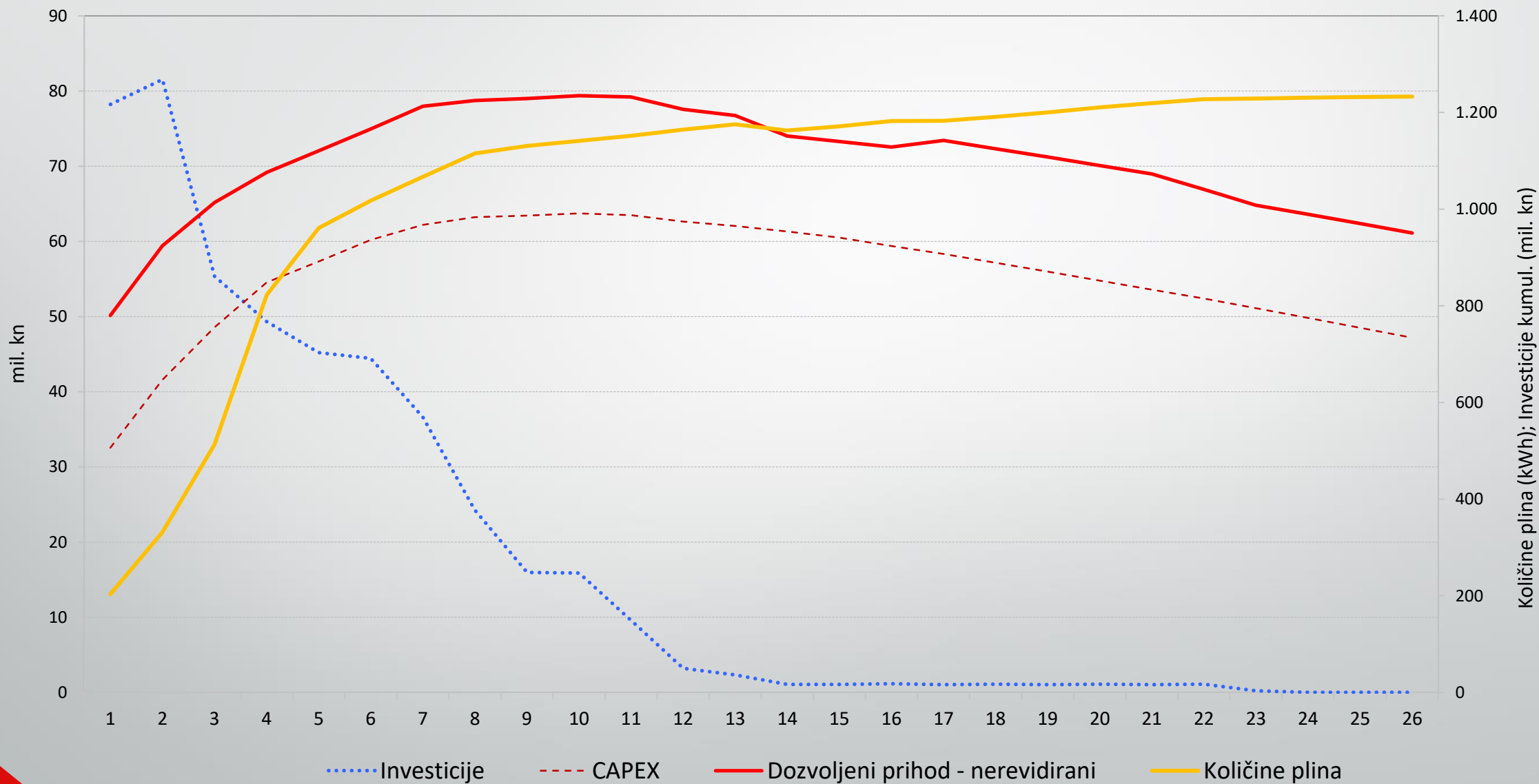
# Regulatory account – principle

- ✓ NPVs of allowed revenues **remain the same** for options with or without RA – but are realized with different dynamics -> operator recoups AR of first years in the later project years, i.e. return on invested capital enabled in longer term



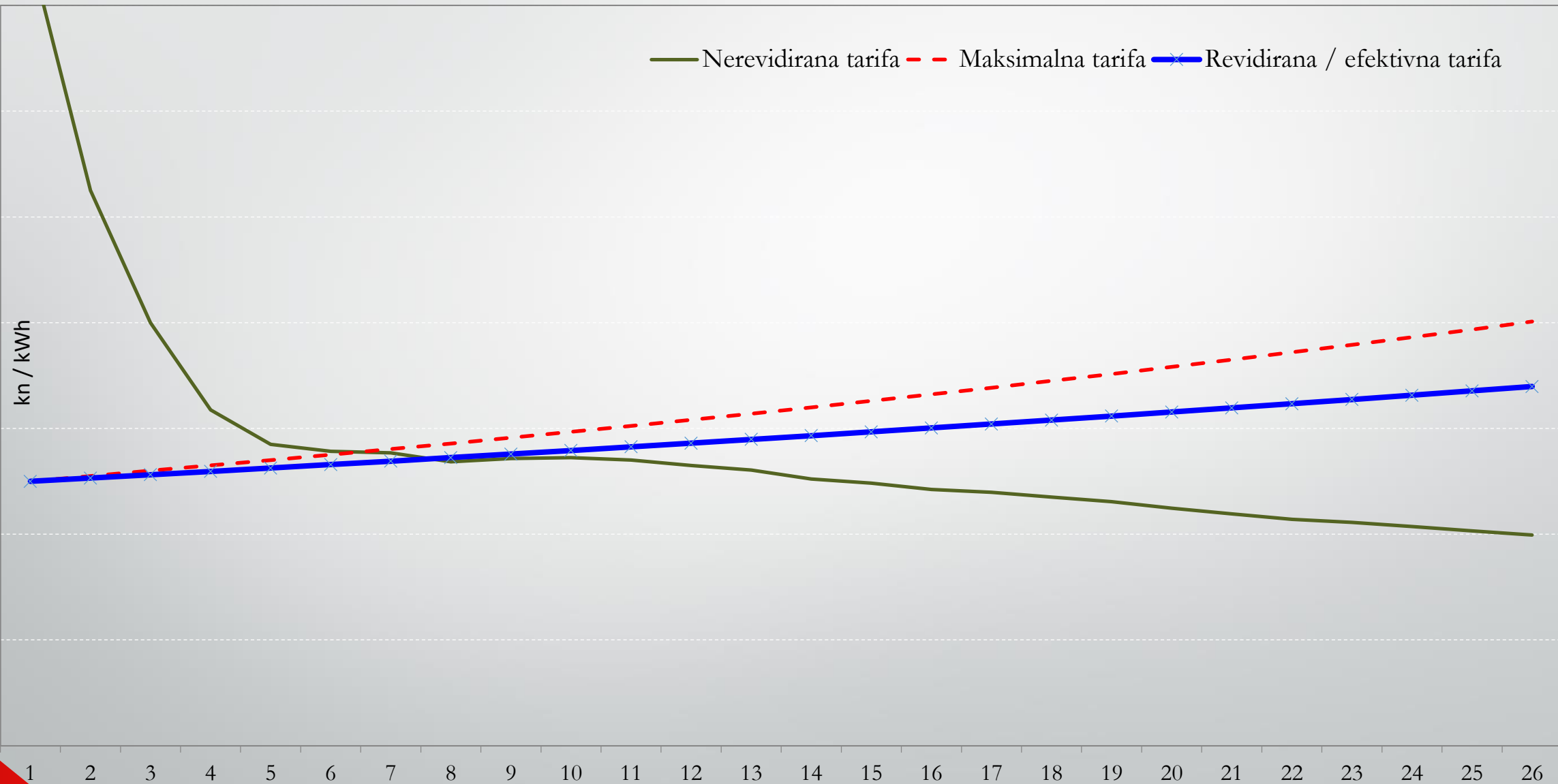


## Regulatory account – principle (2)





# Regulatory account – tariff dynamics (example)



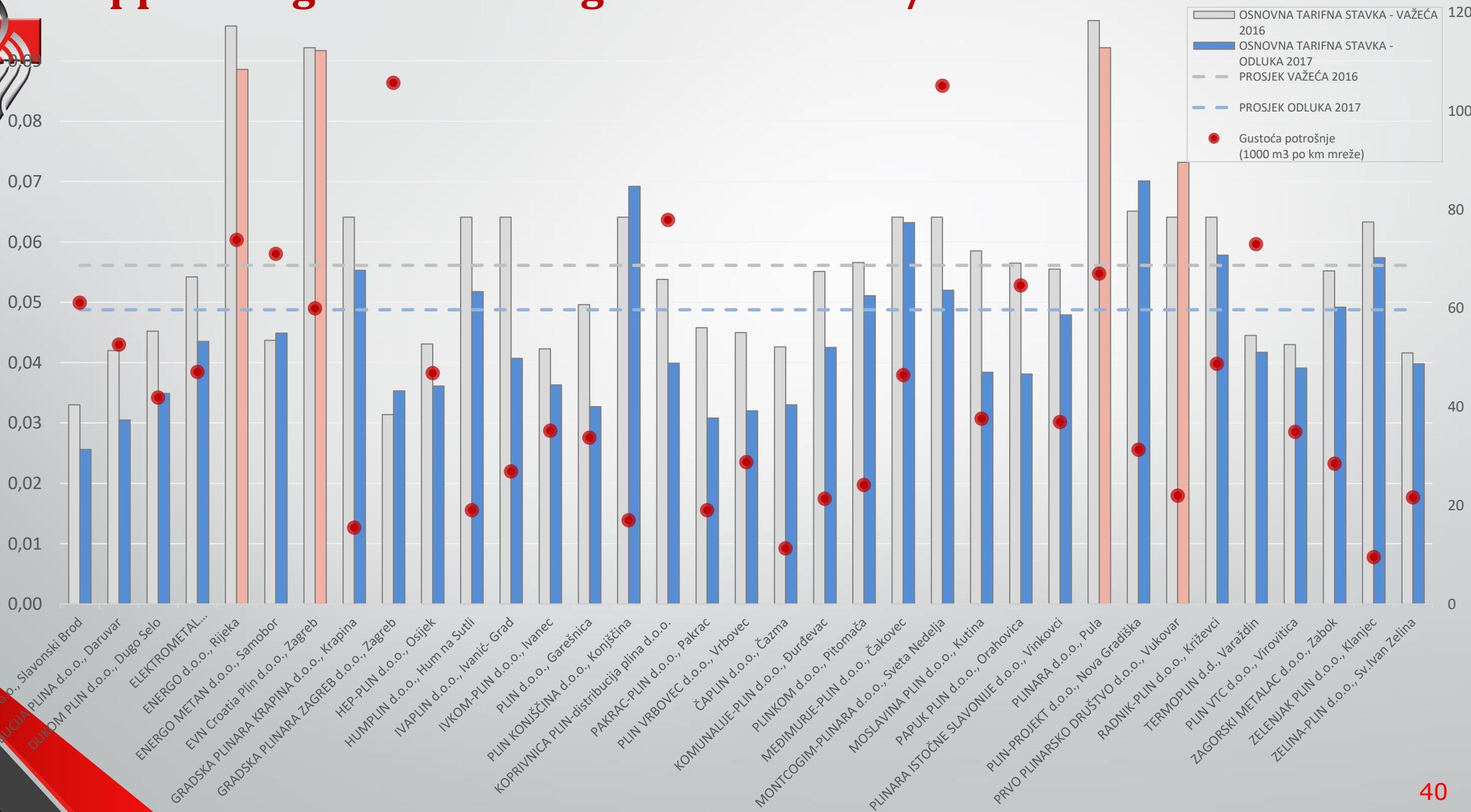




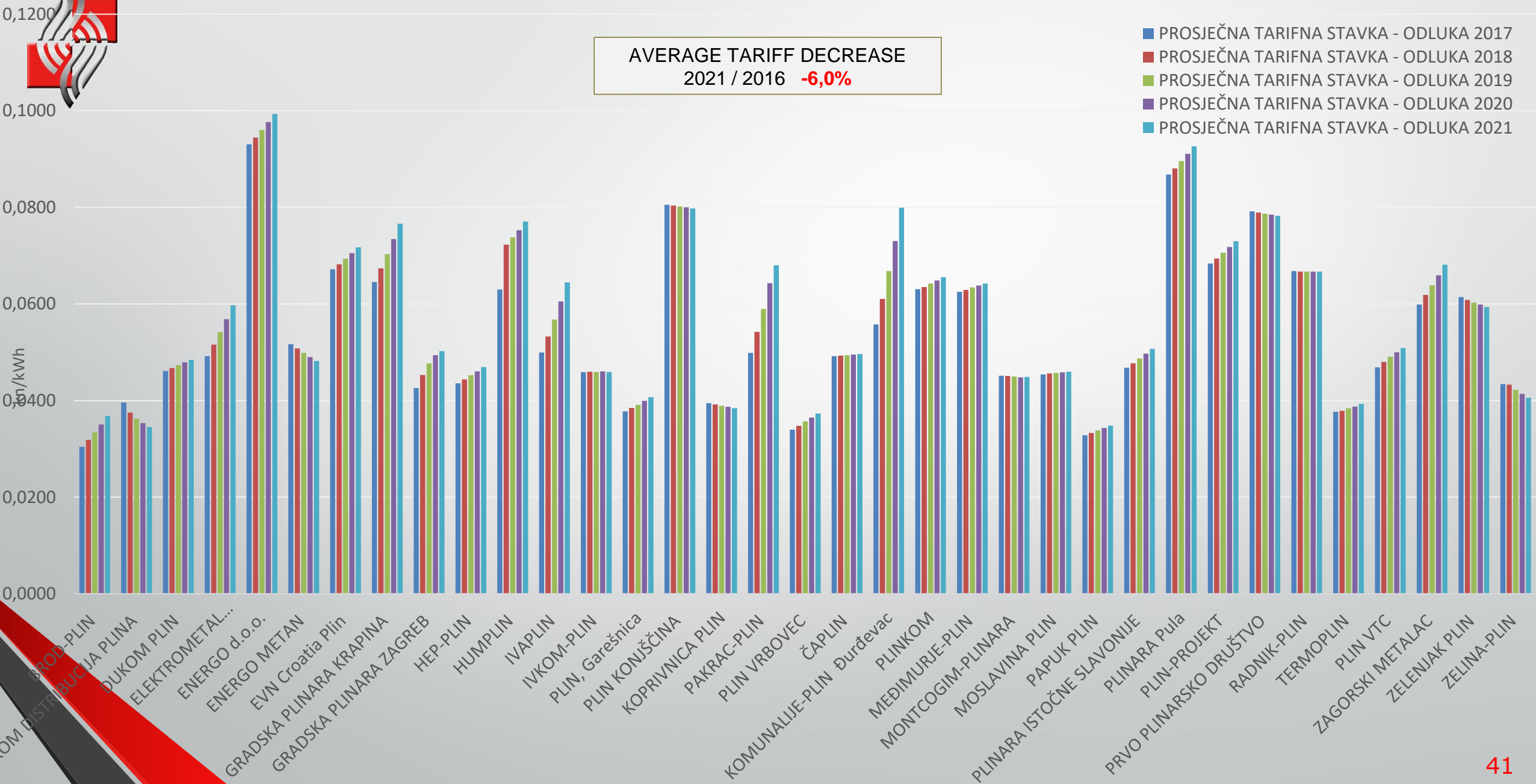
# Approved gas DSO average tariffs - 2016/2017



kn/kWh



# Approved gas DSO average tariffs for 2<sup>nd</sup> reg. period 2017-2021





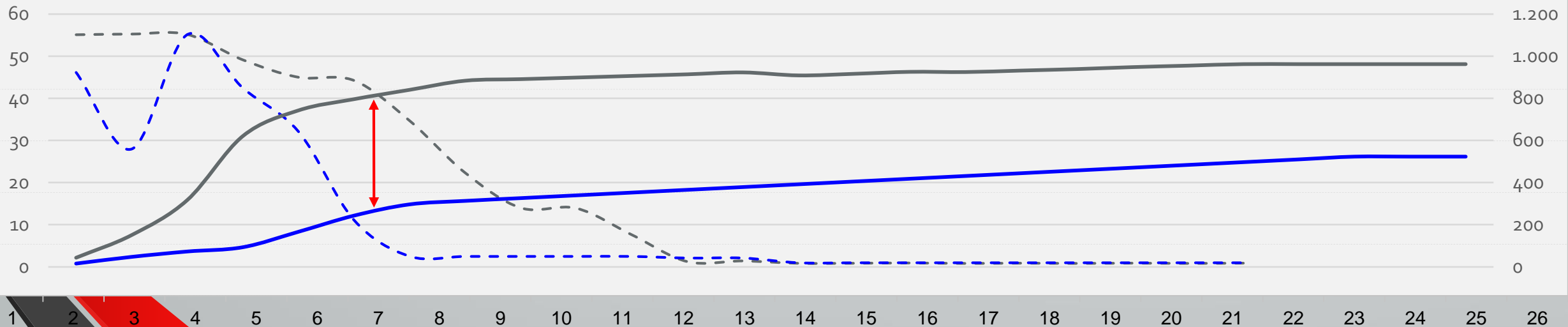
## Regulatory account revision

- RA projection to be corrected **at the end of each regulatory period**
- **approved only reasonable changes** of actual and planned operational and capital costs, capacity usage rate, in relation to initial assumptions
- regulatory account is **not a guarantee of return on investment** → input parameters are planned and therefore a subject to change
- regulatory account is an **instrument of establishing competitive tariffs** in the initial period of infrastructure operation and of compensation of temporarily "lost" part of the allowable revenue
- the mechanism **enables sustainability** of investment in the new gas infrastructure and **prevents discrimination** of consumers connected during first few years in relation to those connected later -> tariffs (revenues) are “normalized” throughout the whole period for which the regulatory account is maintained

# REGULATORY ACCOUNT REVISION – schematic

- ▲●● Maksimalna tarifa
- Revidirana tarifa
- Efektivna tarifa
- Inicijalna tarifa

kn / kWh





## to conclude -> **regulatory investment incentives** -> menu of elements

- **Coverage of OPEX and CAPEX** with incentive regulation
  - ✓ **building blocks** approach
  - ✓ total expenditure – TOTEX approach
  
- **Depreciation policy**
  - ✓ **linear** (straightforward) method, **progressive** method, degressive method and calculation method by effect (functional method)
  - ✓ **regulatory recognized useful life** of certain groups of regulated assets → may deviate from recognized tax rates from a tax standpoint → typically ranging from 30 to 50 years
  
- **Direct investment incentive mechanisms**
  - ✓ additions to **WACC – uplifters**
  - ✓ Early reimbursement of project development costs
  - ✓ **extension of the regulatory period and NPV approach**
  - ✓ approval of the investment budget





Thank you for your attention !

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