TARIFF SYSTEM
FOR NATURAL GAS STORAGE
- DRAFT PROPOSAL

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LEGAL FRAMEWORK FOR TARIFF SYSTEM

Legal basis for Tariff system for natural gas storage, without tariff rates:
- ➢ **Energy Act (OG 68/01, 177/04, 76/07), Art. 28**
- ➢ **Act on the Regulation of Energy Activities (OG 177/04, 76/07), Art. 9**

- ➢ **Market opening strategy: on 1 August 2008 market opening for all customers**
- ➢ **Principle of regulated third party access to underground gas storage (UGS) system based on published tariffs and access conditions**
- ➢ **Gas storage operator (OGS) has function of storage operation & maintenance & develop.**
- ➢ **OGS has to refrain from discriminating between UGS users / operators, provide efficient access to UGS's capacities, contract usage of UGS capacities**
- ➢ **Tariff methodology: HERA – proposal & approval, Ministry/UGS - opinion**
- ➢ **Tariff rates: UGS or HERA – proposal, HERA or UGS - opinion, Ministry – proposal to Government, Government – approval, HERA – app. supervision**

Tariff system defines:
- ➢ **tariff methodology principles and criteria for tariff rates regulation,**
- ➢ **structure of UGS tariff elements and rates,**
- ➢ **data (opex, capex, macroeconomic parameters, risk rates & indicators) and documentation needed to determine costs and max. allowed OGS income,**
- ➢ **justified costs of operation, maintenance, replacement, construction, reconstruction, reasonable return on regulated assets,**
- ➢ **criteria for determining maximum allowed income and its allocation.**

GOALS AND PRINIPLES OF TARIFF SYSTEM

> Tariff system shall be based on justified costs of operation, maintenance, replacement, construction or reconstruction of facilities, taking in account a reasonable return period for investments in energy plants, facilities or system.

> The base principal of method of regulation is rate of return regulation / cost plus method.

> Total yearly income of OGS realised by application of tariff rates should cover the acknowledged total costs (cost-based) and enable return on regulated assets.

> Tariff elements are: reserved UGS volume, usage/working of storage capacity, injection/send-in capacity, withdrawal/send-out capacity, gas cushion & losses volume & services.

> USG structure of rates: capacity reservation (volume, injection capacity, withdrawal capacity), commodity (volumetric injection, volumetric withdrawal), fuel usage (own consumption & operation and cushion & losses gas).

> Minimal value of volume capacity that one user can reserve and contract is a unit block of UGS volume attributed with unit blocks of max. hourly injection and withdrawal capacities and unit block of gas cushion & losses volume.

> Tariff system elements and tariff rates shall enable transparent calculation of costs for the billing period.

CAPACITY INDICATORS FOR TARIFF STRUCTURE DESIGN

- Total working circle duration: $t_{rci} = t_u + t_p$
- Total UGS volume capacity: V_{uk}
- Volume of cushion gas: V_{vpj}
- Total UGS working volume capacity: $V_{rad} = V_{uk} - V_{vpj}$
- Total UGS working volume capacity for users: $V_{ras} = V_{rad} - V_{ngo}$

- Unit block of UGS volume : V_{brv}, is a portion of total UGS working volume capacity which amounts 1,… x 106 Sm3.
- Total number of unit blocks of UGS volume: $K_{brv} = V_{ras} / V_{brv}$

- Unit block of max. hourly injection capacity: $C_{bmku} = C_{ukru} \times (V_{brv}/V_{ras})$

    provided that: $C_{bmku} \geq V_{brv} / [(t_{minu} \times 24 + tu \times 24) / 2)]$

    where minimum time of injection: $t_{minu} = V_{brv} / (C_{bmku} \times 24)$
- Unit block of max. hourly withdrawal capacity: $C_{bmkp} = C_{ukrp} \times (V_{brv}/V_{ras})$

    provided that: $C_{bmkp} \geq V_{brv} / [(t_{minp} \times 24 + tp \times 24) / 2)]$

    where minimum time of withdrawal: $t_{minp} = V_{brv} / (C_{bmkp} \times 24)$

BUSINESS COSTS AND MAX. ALLOWED INCOME OF OGS (1)

➤ **Allowed maximum income of OGS in next / regulatory / year (n=1):**
- **without gas cushion & losses services (purchase and supply):**

$$PDP_{vp,n=1} = PUTP_{vp, n=1} + PRI_{n=1}$$

- **with gas cushion & losses services (purchase and supply):**

$$PDP_{pg,n=1} = PUTP_{pg,n=1} + PRI_{n=1}$$

where

$PUTP_{vp,n=1}$ - acknowledged costs of OGS in next year
$PRI_{n=1}$ - allowed return on regulated assets in next year

➤ **Acknowledged costs of OGS in next year / regulatory year (n=1): :**
- **without gas cushion & losses services (purchase and supply):**

$$PUTP_{vp,n=1} = (OT_{n=0} + AM_{n=0}) \times (1 + srpc_{n=0} / 100) + TPVP_{n=1} + ZPN_{n=1}$$

- **with gas cushion & losses services (purchase and supply):**

$$PUTP_{pg,n=1} = (OT_{n=0} + AM_{n=0}) \times (1 + srpc_{n=0} / 100) + TPVP_{n=1} + TPPG_{n=1} + ZPN_{n=1}$$

where

$OT_{n=0}$ - justified operating costs
$AM_{n=0}$ - depreciation of regulated assets
$srpc_{n=0}$ - index of price rise (consumer or producer price index)
$TPVP_{n=1}$ - cost of gas for UGS own consumption & operation
$ZPN_{n=1}$ - cost of municipal economy dues and liabilities charge
$TPPG_{n=1}$ - cost of gas for cushion & losses services

BUSINESS COSTS AND MAX. ALLOWED INCOME OF OGS (2)

➢ **Realised or estimated justified operating UGS's costs, without gas cushion & losses services (purchase and supply):**

$$OT_{n=0} = MTUE_{n=0} + TTIO_{n=0} + TO_{n=0} + TP_{n=0} + OS_{n=0}$$

where

$MTUE_{n=0}$ - cost of UGS maintenance / operation / energy / other services

$TTIO_{n=0}$ - cost of operational investment and extraordinary expenses

$TO_{n=0}$ - cost of insurance of assets

$TP_{n=0}$ - costs of gross salaries and contributions to gross salaries

$OS_{n=0}$ – other operational costs

➢ **Allowed return on regulated UGS assets of in next year:**

$$PRI_{n=1} = RS_{pros} \times pspi / 100$$

where

$RS_{pros} = (RS_{poc} + RS_{kraj}) / 2$ - average value of regulated UGS assets

RS_{poc} / RS_{kraj} – value of regulated UGS assets at beginning /end of year

$Rs_{kraj} = RS_{poc} + NI_{n=0} - AM_{n=0} - SPBN_{n=0} - ORS_{n=0}$

$SPBN_{n=0}$ - means & assets received without duties & charges

$ORS_{n=0}$ - written off means & assets

$pspi = K_e \times E / (E + D) + K_d \times D \times (1 - spd / 100) / (E + D)$ average rate of return on assets, after taxation

$K_e = R_f + R_p$ - approved rate of return on equity, **Kd** – return on debt

R_f - risk free rate, R_p – risk premium

ALLOCATION OF MAXIMUM ALLOWED OGS INCOME

➤ **Portion of allowed maximum OGS income in next year from reservation of injection and withdrawal UGS capacities:**

$$TZKK_{n=1} = (TO_{n=0} + AM_{n=0}) \times (1 + srpc_{n=0} / 100) + PRI_{n=1}$$

- portion of allowed income from reservation of max. injection hourly/day capacity:

$$TZKU_{n=1} = TZKK_{n=1} \times [(C_{ukru} \times t_u / (C_{ukru} \times t_u + C_{ukrp} \times t_p))]$$

- portion of allowed income from reservation of max. withdrawal hourly/day capacity:

$$TZKP_{n=1} = TZKK_{n=1} \times [(C_{ukrp} \times t_p / (C_{ukru} \times t_u + C_{ukrp} \times t_p))]$$

➤ **Portion of allowed maximum OGS income in next year from reservation and usage of working UGS volume capacity:**

$$TZKRV_{n=1} = (PDP_{vp,n=1} - TZKK_{n=1})$$

- portion of allowed income from reservation of working volume capacity:

$$TZRV_{n=1} = (TZKRV_{n=1} - TPVP_{n=1}) / 2$$

- portion of allowed income in next year from usage off working UGS volume:

$$TKRV_{n=1} = TZKRV_{n=1} - TZRV_{n=1}$$

- portion of allowed income from injected gas volume:

$$TKRVU_{n=1} = (TKRV_{n=1} + TPVP_{n=1}) / 2$$

- portion of allowed income from withdrawn gas volume:

$$TKRVP_{n=1} = TKRV_{n=1} - TKRVU_{n=1}$$

➤ **Portion of allowed maximum OGS income in next year from gas for cushion & losses services (purchase & supply):**

$$TPPG_{n=1} \text{ - cost of gas for cushion \& losses services (estimated)}$$

CALCULATION OF GAS STORAGE TARIFF RATES

UGS tariff rates (charges):

➤ **for reserved working UGS volume capacity (monthly charge):**

$$T_{mzrv} = [\ TZRV_{n=1} / (\ V_{ras} / 1000\ )\ ] / 12\ ,\ [kn/1000\ Sm3]$$

➤ **for monthly injected gas volume:**

$$T_{mku} = TKRVU_{n=1} / (\ V_{ras} / 1000\ )\ ,\ [kn/1000\ Sm3]$$

➤ **for monthly withdrawn gas volume:**

$$T_{mkp} = TKRVP_{n=1} / (\ V_{ras} / 1000\ )\ ,\ [kn/1000\ Sm3]$$

➤ **for gas cushion & losses services (gas wholesale, transport, taxation and supply services):**

$$T_{omg} = TPPG_{n=1} / QOMG = TJN + TJT\ ,\ [kn/Sm3]$$

➤ **for reserved and used max. hourly/daily injection capacity:**

$$T_{mzkku} = TZKU_{n=1} / [\ (C_{ukru} \times t_u \times 12) / (\ t_u + t_p\ )\ ]\ ,\ [kn/m3/sat]$$

➤ **for reserved and used max. hourly/daily withdrawal capacity:**

$$T_{mzkkp} = TZKP_{n=1} / [\ (C_{ukrp} \times t_p \times 12) / (\ t_u + t_p\ )\ ]\ ,\ [kn/m3/sat]$$

TOTAL INCOME OF OGS BASED ON TARIFF RATES (1)

Expected income of OGS in next / regulatory / year (n=1) calculated with proposed / approved UGS tariff rates:

➤ **if portion of income from gas cushion & losses services is excluded:**

$$DP' = \sum_{m=1}^{12} \sum_{k=1}^{K} (V_k^{zrv} \times T_{mzrv} + V_{m,k}^{mut} \times T_{mku} + V_{m,k}^{mpov} \times T_{mkp} + C_{m,k}^{zku} \times T_{mzkku} \times k_m^u + C_{m,k}^{zkp} \times T_{mzkkp} \times k_m^p)$$

➤ **if portion of income from gas cushion & losses services is included:**

$$DP'' = DP' + \sum_{m=1}^{12} \sum_{k=1}^{K} (Q_{m,k}^{omg} \times T_{omg})$$

where

     - mutual relations of injection vs withdrawal days in month

$$k_m^u = d_m^u / (d_m^u + d_m^p)$$

$$k_m^p = d_m^p / (d_m^u + d_m^p)$$

d_m^u **– number of injection days in month**

d_m^p **– number of injection days in month**

TOTAL INCOME OF OGS BASED ON TARIFF RATES (2)

Basic condition: expected income of OGS in next regulatory year calculated with proposed / approved UGS tariff rates may not surpass allowed maximum income of OGS in next regulatory year:

➢ **if portion of income from gas cushion & losses services is excluded:**

$$DP' \leqslant PDP_{vp,n=1}$$

➢ **if portion of income from gas cushion & losses services is included:**

$$DP'' \leqslant PDP_{pg,n=1}$$
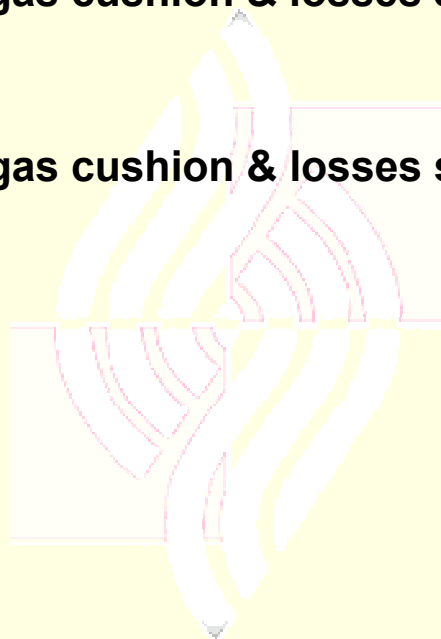
EXAMPLE OF TARIFF SYSTEM APPLICATION (1)

Note: Calculation done with estimated data!

Tariff rates (charges) allocated to various services offered by OGS:

➤ **for reserved working UGS volume capacity (monthly charge):**

T_{mzrv} = 1,5382 kn/1000 Sm3

➤ **for monthly injected gas volume:**

T_{mku} = 19,8925 kn/1000 Sm

➤ **for monthly withdrawn gas volume:**

T_{mkp} = 9,2294 kn/1000 Sm3

➤ **for gas cushion & losses services (gas wholesale, transport, taxation and supply services):**

T_{omg} = 1,190 kn/Sm3

➤ **for reserved and used max. hourly/daily injection capacity:**

T_{mzkku} = 0,8787 kn/m3/h

➤ **for reserved and used max. hourly/daily withdrawal capacity:**

T_{mzkkp} = 0,8787 kn/m3/h

EXAMPLE OF TARIFF SYSTEM APPLICATION (2)

Dozvoljeni ukupni prihod i prihodi po tarifnim elementima operatora sustava skladišta plina

Allowed maximum income of OGS and amount and structure of expected income of OGS in next regulatory year calculated with proposed / approved UGS tariff rates; OGS income from gas cushion&losses services excluded / included

Legend:
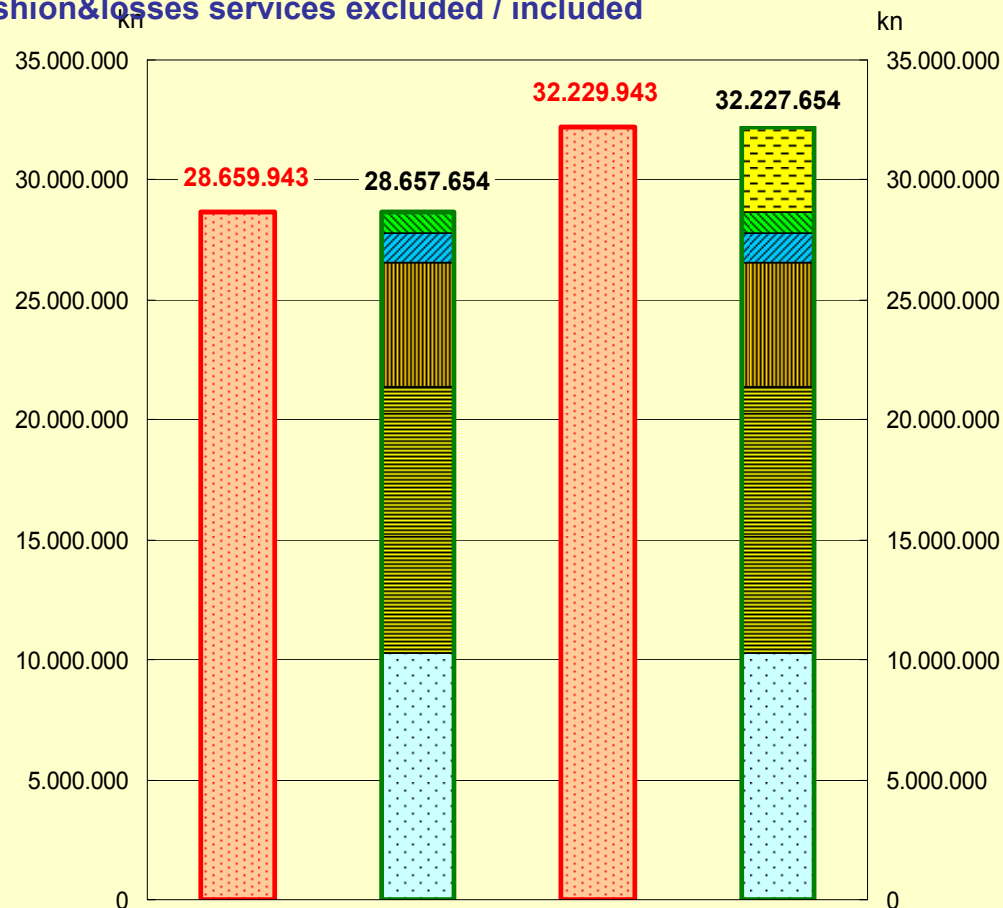
- Ukupni dozvoljeni prihod opertora sustava skladišta plina (kn)
  - allowed max. income of OGS
- Prihod od ukupne količine plina koja je nabavljena za pokriće potreba održavanja osnovne mase i gubitaka sustava skladišta plina, (kn)
  -income from gas cushion&losses services
- Prihod od ukupno zakupljenog maksimalnog satnog kapaciteta utiskivanja plina, (kn)
  - income from reserved injection capacity
- Prihod od ukupno zakupljenog maksimalnog satnog kapaciteta povlačenja plina, (kn)
  -income from reserved withdrawal capacity
- Prihod od ukupne količine prirodnog plina koja je tijekom mjeseca povučena iz skladišnog prostora sustava skladišta plina, (kn)
  - income from withdrawn gas volume
- Prihod od ukupne količine prirodnog plina koja je tijekom mjeseca utisnuta u skladišni prostor sustava skladišta plina, (kn)
  - income from injected gas volume
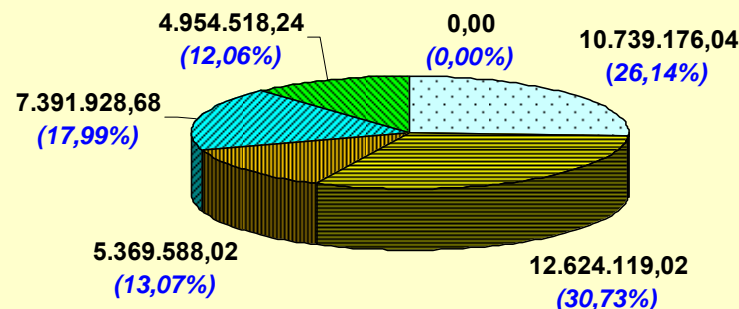- Prihod od ukupno zakupljenog radnog volumena skladišnog prostora, (kn)
  - income from reserved UGS volume
- Ukupni prihod operatora sustava skladišta plina (kn)
  - expected total OGS income

Chart values: 28.659.943, 28.657.654, 32.229.943, 32.227.654
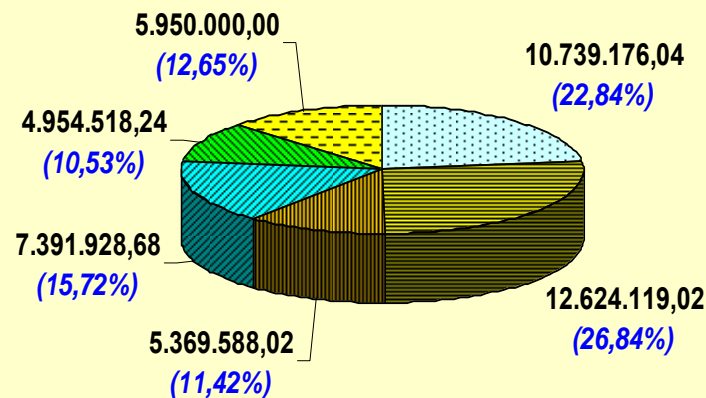
EXAMPLE OF TARIFF SYSTEM APPLICATION (3)

Prihodi po tarifnim elementima i struktura ukupnog prihoda operatora sustav skladišta plina
(bez prihoda od nabave/prodaje plina za pokriće potreba osnovne mase i gubitaka plina u sustavu skladišta plina)

4.954.518,24
(12,06%)

0,00
(0,00%)

10.739.176,04
(26,14%)

7.391.928,68
(17,99%)

5.369.588,02
(13,07%)

12.624.119,02
(30,73%)

Allowed maximum OGS income and amount and structure of expected OGS income in next year calculated with proposed / approved UGS tariff rates; OGS income from gas cushion&losses excluded

☐ Prihod od ukupno zakupljenog radnog volumena skladišnog prostora, (kn)

▤ Prihod od ukupne količine prirodnog plina koja je tijekom mjeseca utisnuta u skladišni prostor sustava skladišta plina, (kn)

▥ Prihod od ukupne količine prirodnog plina koja je tijekom mjeseca povučena iz skladišnog prostora sustava skladišta plina, (kn)

▨ Prihod od ukupno zakupljenog maksimalnog satnog kapaciteta povlačenja plina, (kn)

■ Prihod od ukupno zakupljenog maksimalnog satnog kapaciteta utiskivanja plina, (kn)

▨ Prihod od ukupne količine plina koja je nabavljena za pokriće potreba održavanja osnovne mase i gubitaka sustava skladišta plina, (kn)

Prihodi po tarifnim elementima i struktura ukupnog prihoda sustava skladišta plina
(sa prihodom od nabave/prodaje plina za pokriće potreba osnovne mase i gubitaka plina u sustavu skaldišta plina)

5.950.000,00
(12,65%)

10.739.176,04
(22,84%)

4.954.518,24
(10,53%)

7.391.928,68
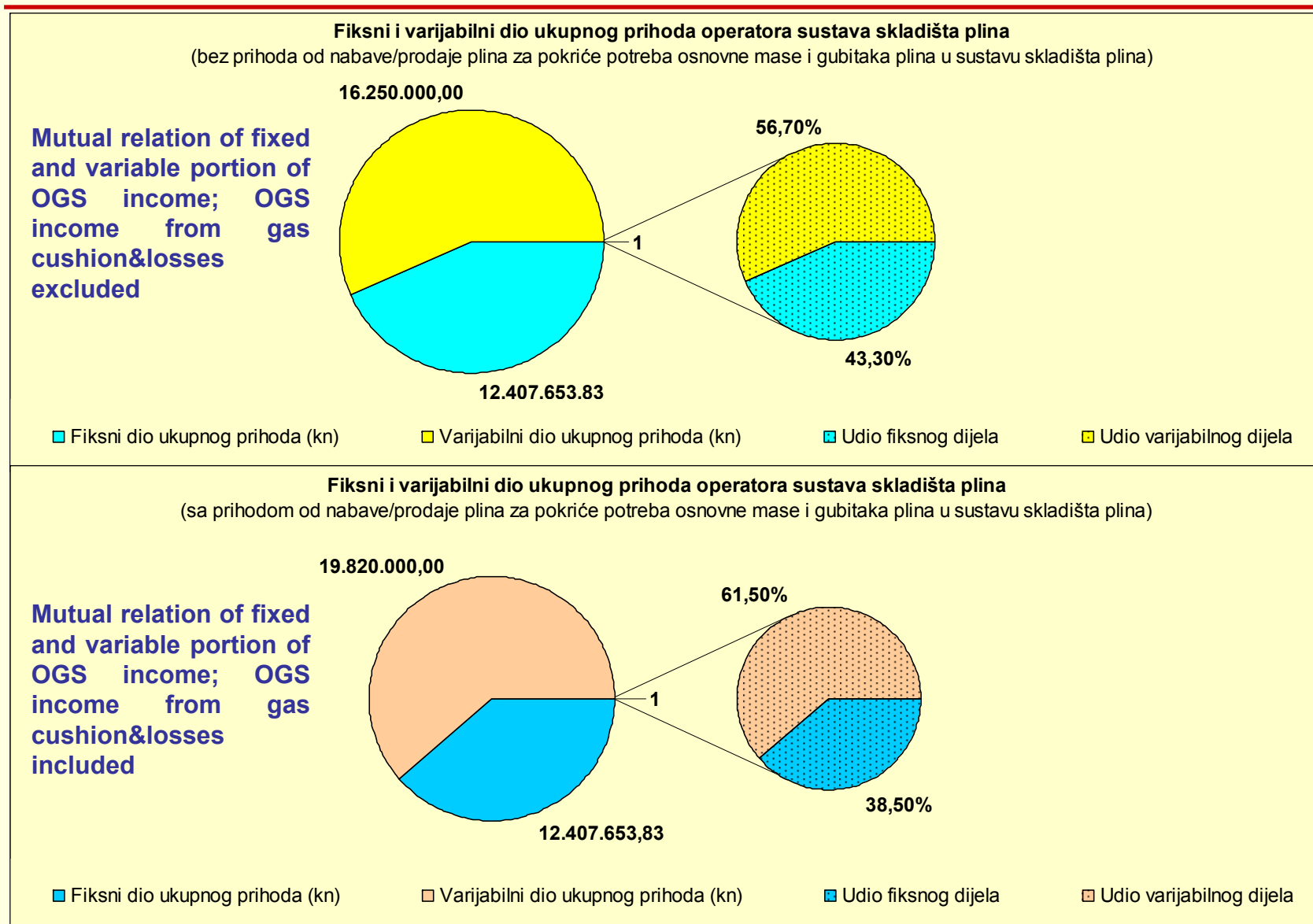*(15,72%)*

12.624.119,02
(26,84%)

5.369.588,02
(11,42%)

Allowed maximum OGS income and amount and structure of expected OGS income in next year calculated with proposed / approved UGS tariff rates; OGS income from gas cushion&losses included

EXAMPLE OF TARIFF SYSTEM APPLICATION (4)

Fiksni i varijabilni dio ukupnog prihoda operatora sustava skladišta plina
(bez prihoda od nabave/prodaje plina za pokriće potreba osnovne mase i gubitaka plina u sustavu skladišta plina)

Mutual relation of fixed and variable portion of OGS income; OGS income from gas cushion&losses excluded

16.250.000,00

56,70%

1

43,30%

12.407.653.83

☐ Fiksni dio ukupnog prihoda (kn)   ☐ Varijabilni dio ukupnog prihoda (kn)   ☐ Udio fiksnog dijela   ☐ Udio varijabilnog dijela

Fiksni i varijabilni dio ukupnog prihoda operatora sustava skladišta plina
(sa prihodom od nabave/prodaje plina za pokriće potreba osnovne mase i gubitaka plina u sustavu skladišta plina)

Mutual relation of fixed and variable portion of OGS income; OGS income from gas cushion&losses included

19.820.000,00

61,50%

1

38,50%

12.407.653,83

☐ Fiksni dio ukupnog prihoda (kn)   ☐ Varijabilni dio ukupnog prihoda (kn)   ☐ Udio fiksnog dijela   ☐ Udio varijabilnog dijela

Thank you for your kind attention!

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