

# Current Energy Crisis, Challenges and Potential Solutions for Albanian Power Sector

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# Topics to be covered

- 1- The latest energy crisis and its impact on Albanian power sector
- 2- An overview on consumption, domestic generation and installed capacity in power sector in Albania
- 3- Demand forecast and plans for new capacity generation
- 4- Conclusions
- 5- Potential solutions in medium to long term

# 1. The latest energy crisis and its impact on Albanian power sector

- **Energy crisis in Europe** - end of summer 2021 marks the beginning
  - **Main Causes:**
    - increased post-covid demand, low gas storage, supply contraction, etc.
  - **Consequences:**
    - **Very high TTF average spot gas prices** - *in 21 December 2021 were 6 times more than beginning of June*
    - **High wholesale electricity prices** - *on 21 December 2021, day-ahead electricity prices exceeding €400/MWh for almost three quarters of Europeans.*
    - **Hungarian Power Exchange (HUPX)** - *The annual average day ahead market price of electricity in baseload in 2021 was 113 Euro/MWh compared to 39 Euro/MWh in 2020*
  - **Invasion of Ukraine from Russia**- *situation worsen, on 7 March 2022 the daily average TTF was 212 €/MWh, while intraday prices were above 300 €/MWh*

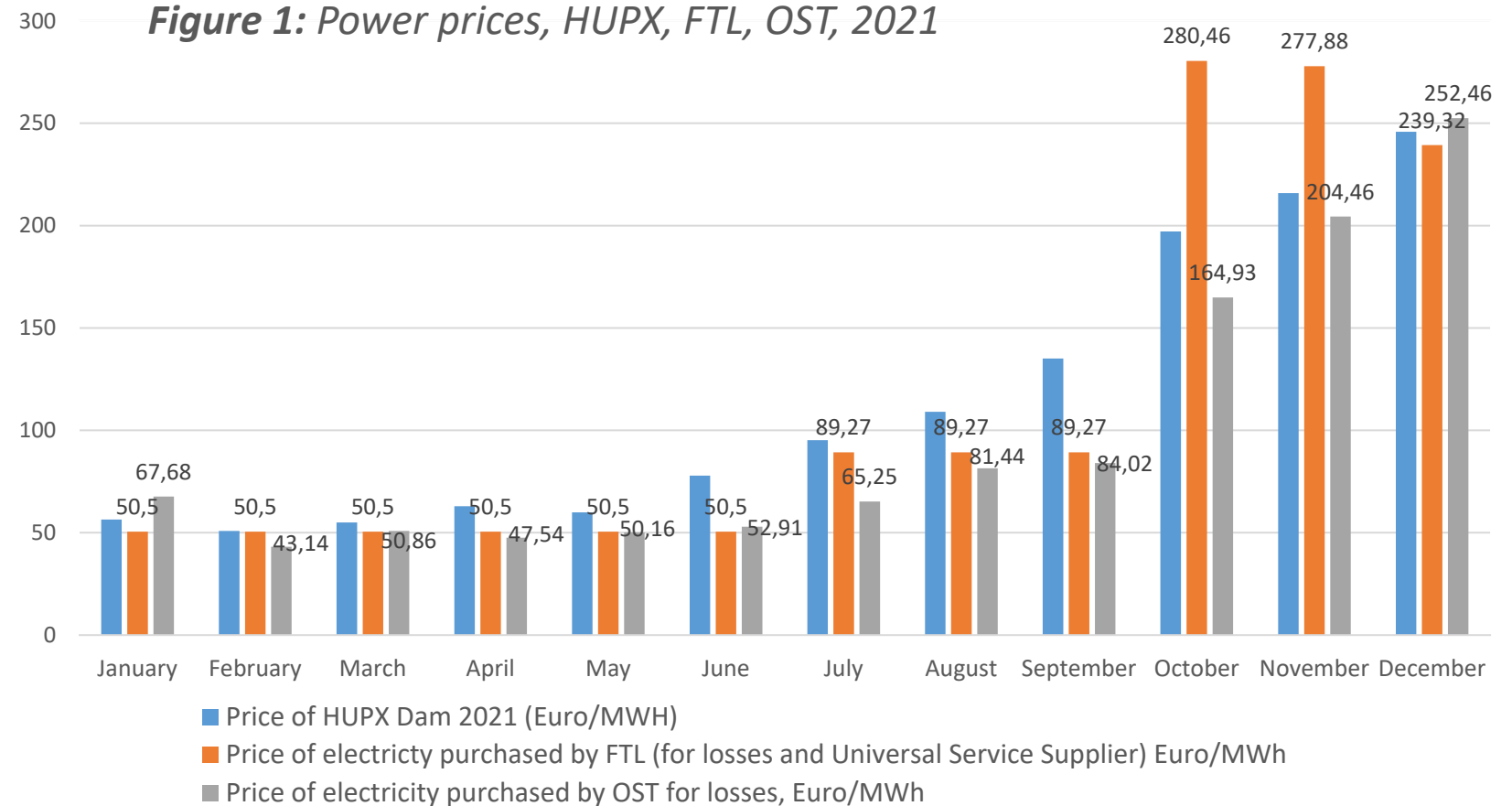
# 1. The latest energy crisis and its impact on Albanian power sector

## Impact on market prices in Albania

➤ **Energy crisis in Europe – an immediate impact on electricity market prices in Albania**

- **Higher electricity prices - purchased on the market by the Free Market Supplier (FTL)**

*Figure 1: Power prices, HUPX, FTL, OST, 2021*



**Companies with public service obligation:**

- Public Generation company (**KESH sh.a.**) is in charge of electricity supply to Universal Service Supplier (FSHU) and after the state of emergency declared in October 2021 supply to cover electricity distribution losses;
- Public company 'Free Market Supplier' (**FTL**), is in charge of purchasing electricity from renewable sources (domestic) and in unregulated market for covering distribution losses and for the FSHU;
- Public company 'Universal service supplier' (**FSHU**), supply electricity with regulated tariffs to consumers that benefit from the universal service supplier, and is also supplying as Last Resort Supplier (FMF) to customer connected to 35 KV with the price decided by the Energy Regulator.

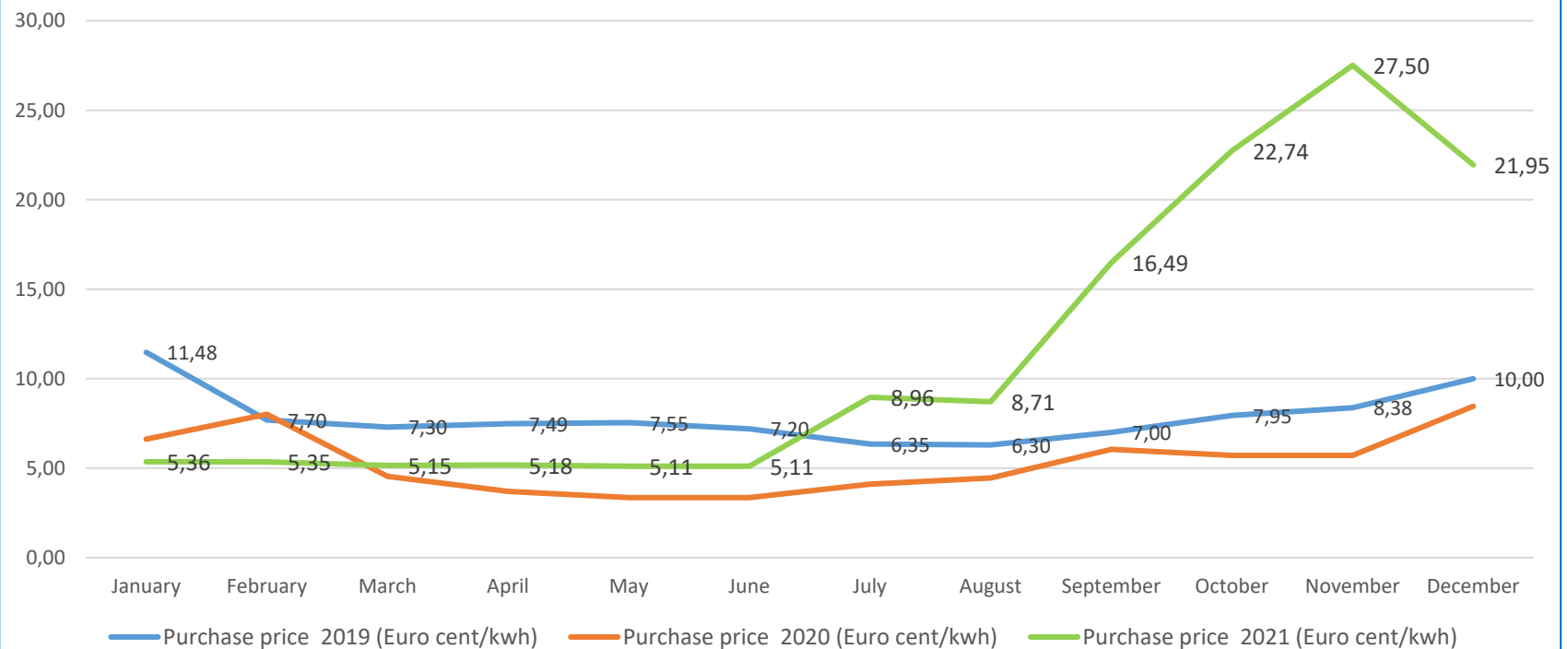
# 1. The latest energy crisis and its impact on Albanian power sector

## Consumers that suffered

### ➤ Who suffered the most?

- Consumers in the liberalized market
- Consumers supplied by the Last Resort Supplier (FMF)
- Universal Service Supplier, as no changes are made to the prices of households and consumers connected to LV

**Figure 2: Electricity purchase prices by FMF in 2019, 2020 and 2021**



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## Financial impact in year 2021

- High financial pressure on OSHEE sha and government of Albania.
- 95% of the electricity purchased in the unregulated market from FTL corresponds to the period August-December 2021

**Table 1:** Electricity imports purchased by public companies, 2021

	Quantity (MWh)	Average price (euro/MWh)	Value excluding VAT (Euro)
OST sh.a	187,750	99.7	18,716,803
FTL sh.a (OSHEE group)	1,117,938	205.1	229,120,113
OST + FTL	1,305,688	189.8	247,836,916

# 1. The latest energy crisis and its impact on Albanian power sector

## Financial impact in year 2022

### ➤ Electricity imports

- For 4 months of year 2022, were spent almost **130 million Euros** to purchase electricity in the market
- Last 5 months of 2021 and the first 4 months of 2022, **altogether an amount of around 370 million euros** were spent for electricity imports

**Table 2:** Electricity imports, January-April 2022, purchased by Public Generation Company (KESH sh.a.)

Electricity imports (KESH)			
Months	Quantity MWh	Price Euro/MWh	Value excluding VAT Euro
January	137,750.00	237.23	32,677,830.40
February	209,736.00	230.35	48,311,803.76
March	165,655.00	237.90	39,408,782.65
April	44,328.00	209.62	9,291,902.74
<b>Total</b>	<b>557,469.00</b>	<b>232.64</b>	<b>129,690,319.55</b>

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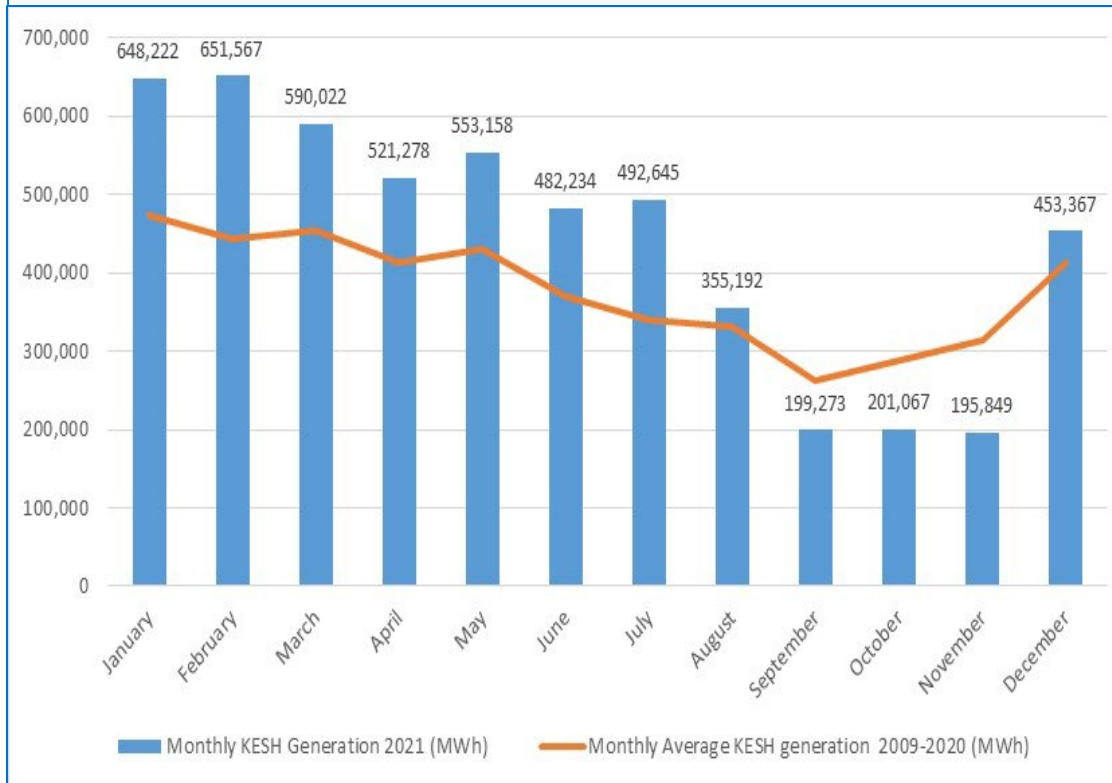
- Year 2021 – the best historical year for domestic generation (**8.9 TWh**)
- **Why such an immediate impact of European energy crisis to Albania?**
  - Domestic generation mostly hydro – imports necessary when no rain
  - Drin river Cascade should have been more carefully managed - by the public generation company
    - generation during summer 2021 was well above average
    - consumption above historical average throughout 2021 (**8.4 TWh**)
    - resulting in significant lowering of the Fierza lake level



# 1. The latest energy crisis and its impact on Albanian power sector

## Public generation during 2021

**Figure 3: Monthly generation in 2021, and historical average**



**Figure 4: Fierza lake level, in 2021 and historical average**



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## Situation at the beginning of 2022

- High electricity market prices
- Not favorable weather conditions (no rain)
- Level of Fierza lake approaching its lowest historical level (257 m beginning of April)
- Monthly consumption above average

Figure 5: Monthly generation 2022 (MWh)

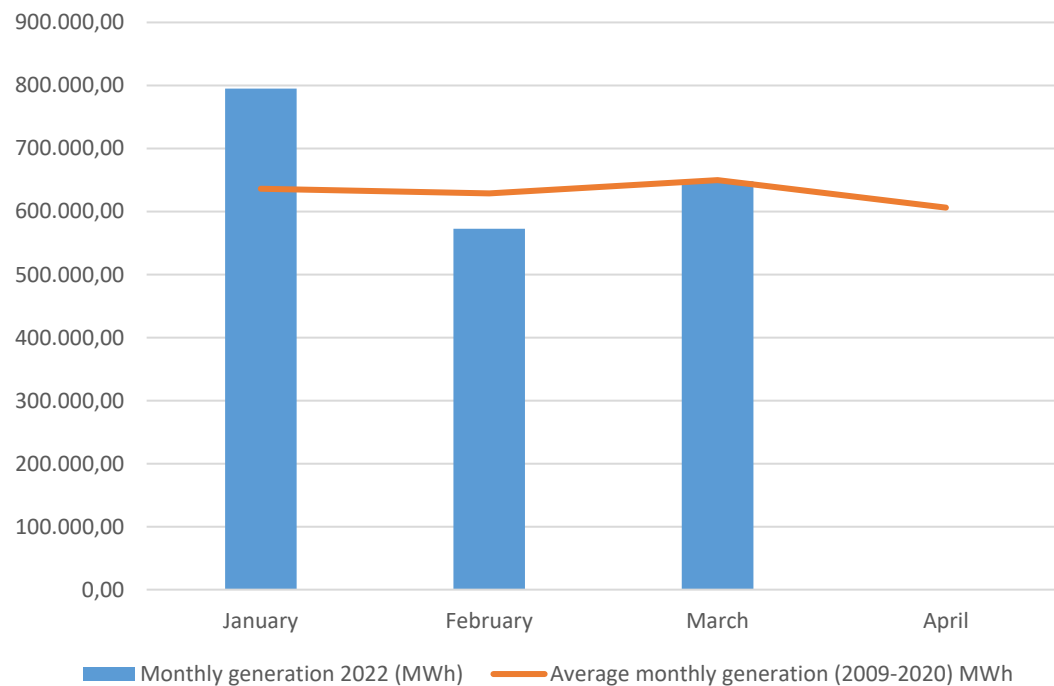
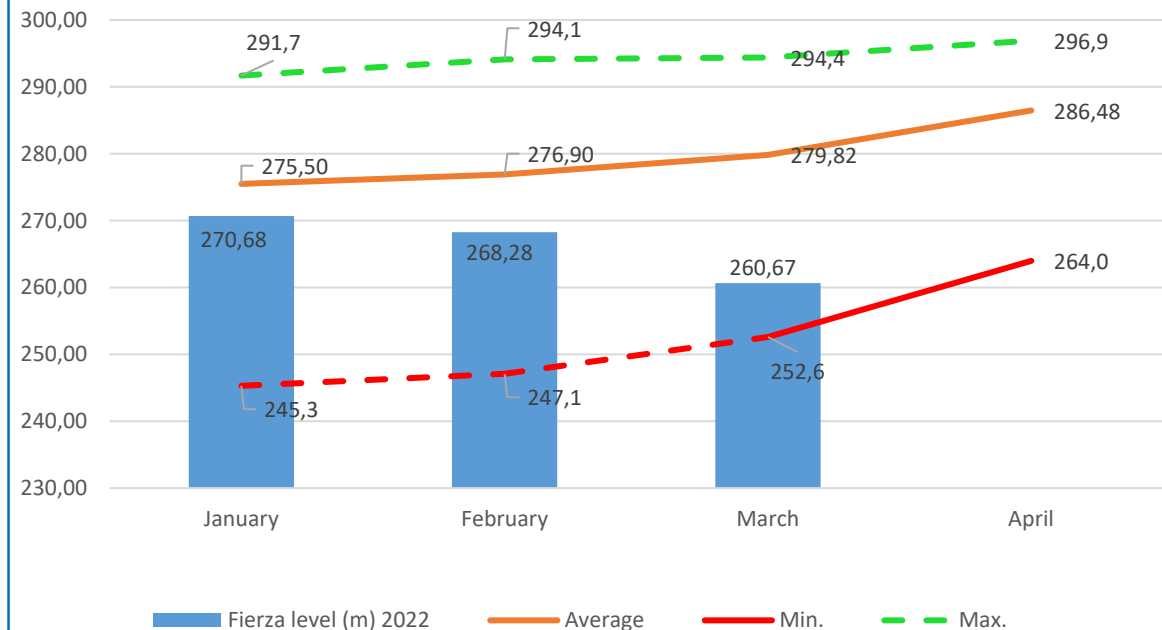


Figure 6: Fierza lake level, January-March 2022



# 1. The latest energy crisis and its impact on Albanian power sector

## Results of 8 months of energy crisis

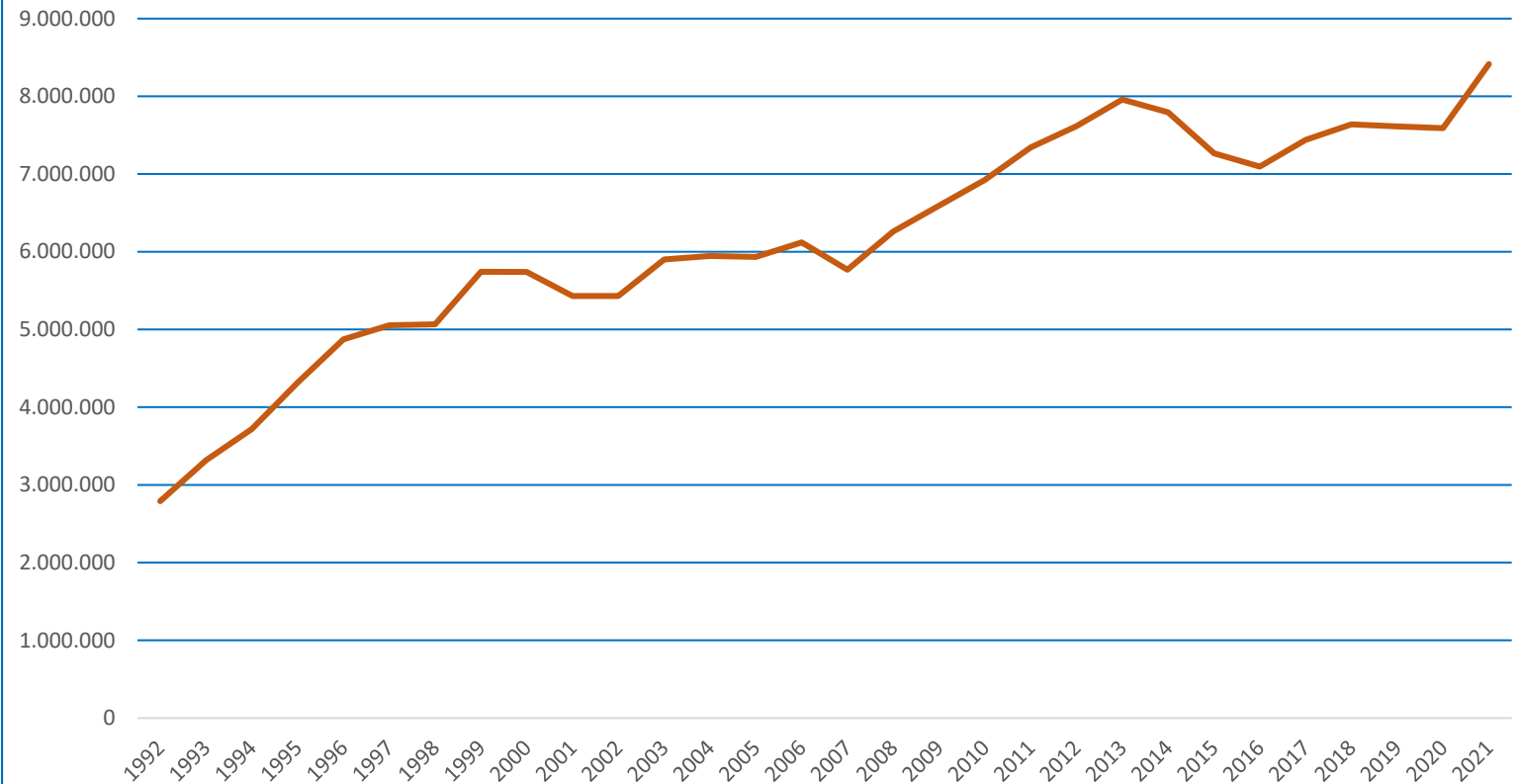
- Beginning of April 2022 the power system was close to collapse
  - Security of supply was at stake
  - Huge expenses for electricity imports (constituting 8% of annual total budget expenses)
- **Has the situation being resolved?**
- **God helped us again** – the rain started in April and the domestic generation has recovered
  - Similar situation has happened in 2001-2002 and 2007
- **Security of supply is still a big issue** - vulnerable to weather conditions and market fluctuations
- **The problem of the Albanian power system is more fundamental and has its roots in the portfolio of technologies of the generating resources.**

## 2. An overview on consumption, installed capacity and domestic generation in power sector in Albania

### Consumption, 1992-2021

- Increased steadily during the last 30 years
- From 2.8TWh in 1992 to 8.4TWh in 2021
- Average annual growth rate (CAGR) is 3.75%
- CAGR is only 2.6% after 2007

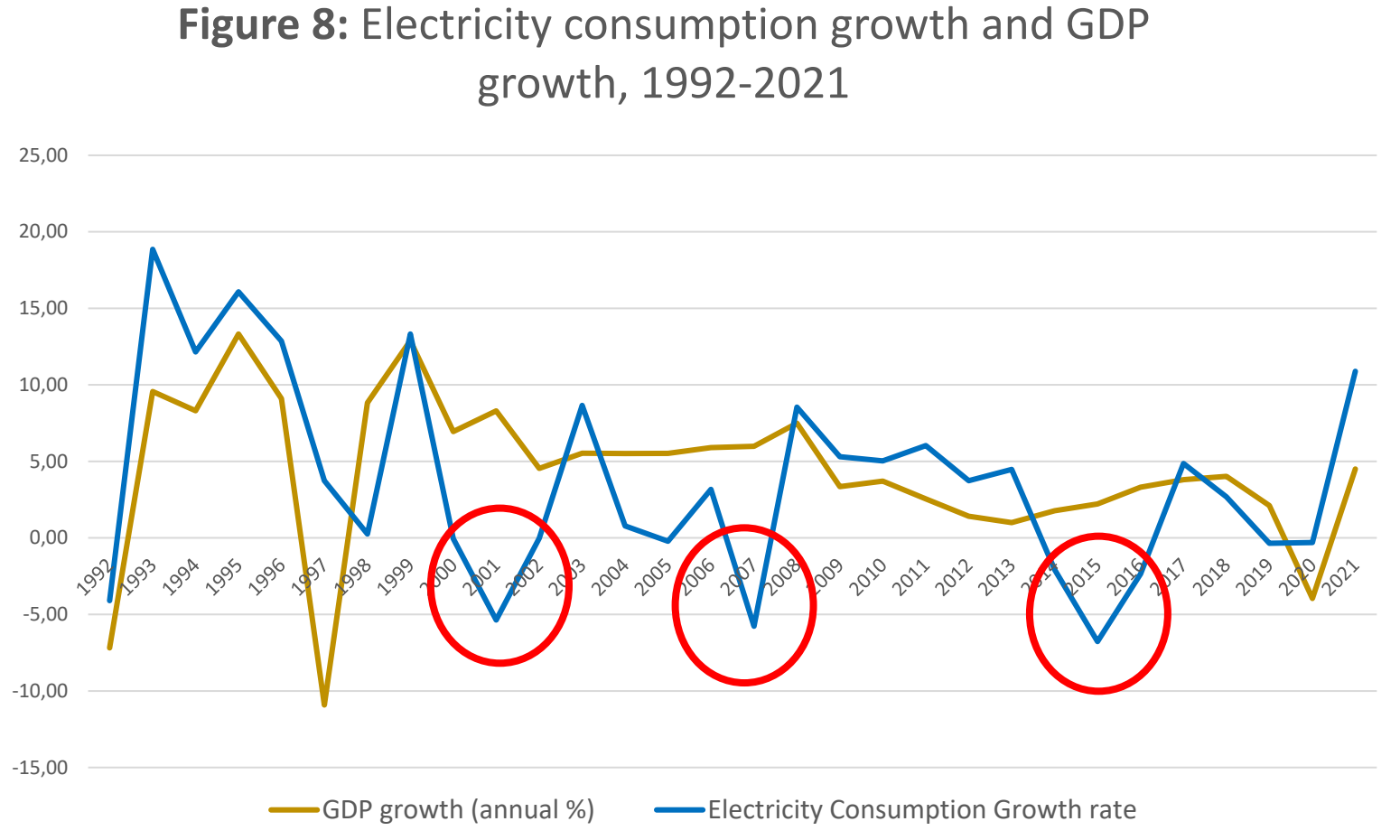
Figure 7: Yearly Consumption in MWh, 1992-2021



## 2. An overview on electricity consumption, installed capacity and domestic generation in power sector in Albania

### Electricity consumption and GDP growth, 1992-2021

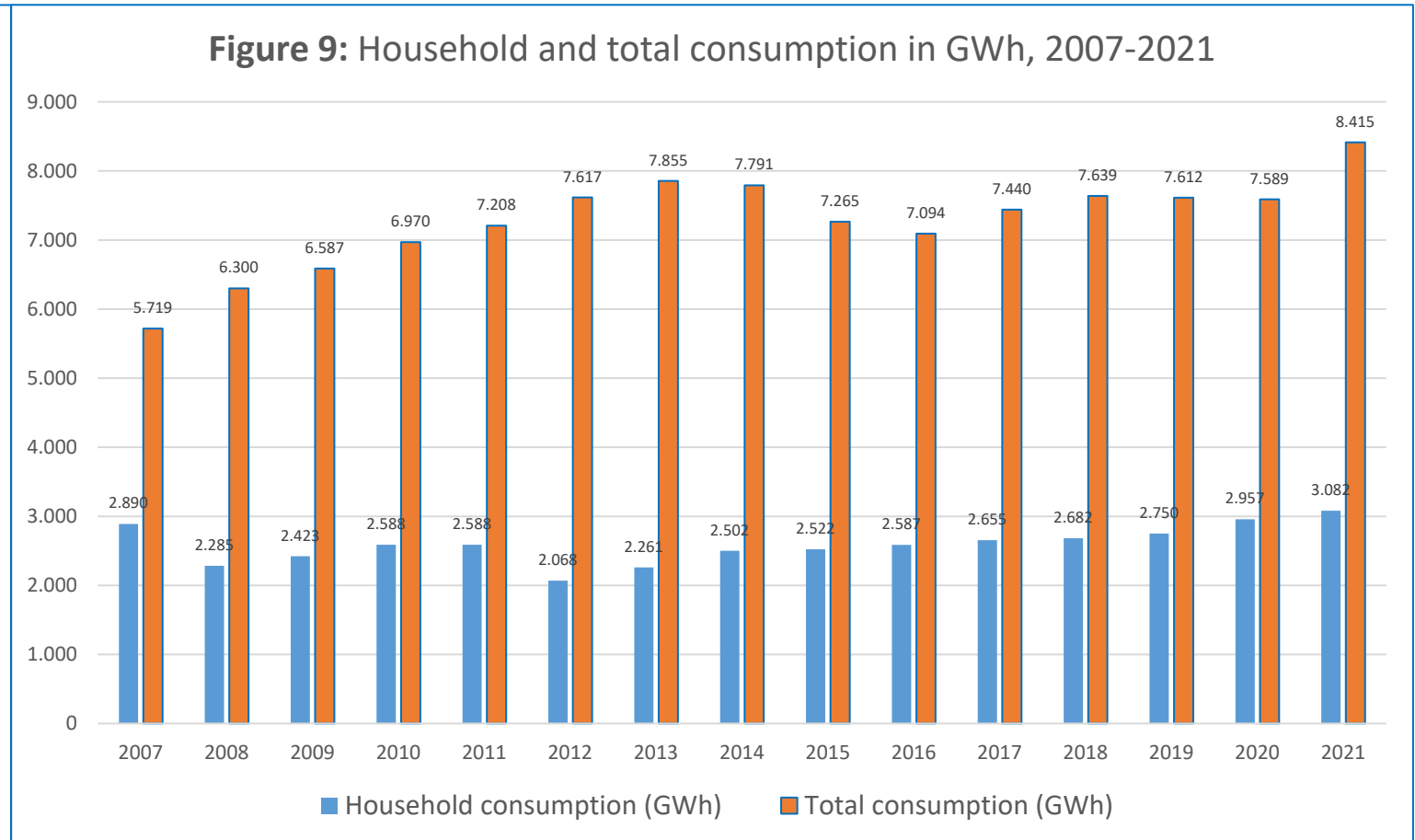
- Obviously, consumption growth followed GDP growth, except years 2001-2002, 2007 and 2015
- Years 2001-2002 and 2007 - dry weather, significant power outages
- 2015, government campaign to penalize consumers who did not pay for their electricity consumption



## 2. An overview on electricity consumption, installed capacity and domestic generation in power sector in Albania

### Household consumption vs. total consumption

- Household consumption was 51% in 2007
- Dropped to 36% in 2008, has remained at this level thereafter
- Annual average growth rate only 0.4% during last 15 years

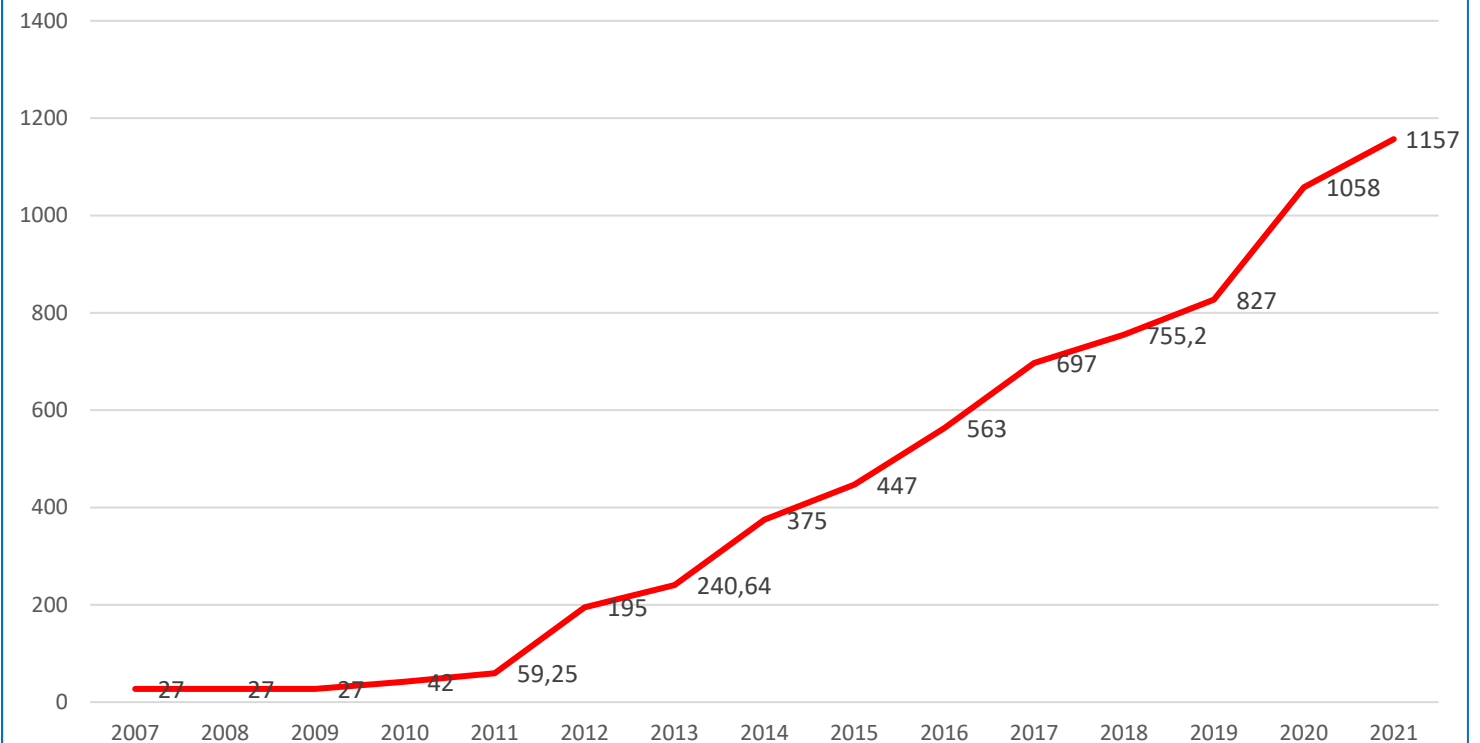


## 2. An overview on electricity consumption, installed capacity and domestic generation in power sector in Albania

### Installed generation capacity

- 1505 MW in 2007
- 2605 MW in 2021
- 95% hydro generation
- Average annual growth 3.75% during the last 15 years
- Main increase from the private sector hydro generation, with average annual growth of 28.5%

**Figure 10:** Installed capacity of private HPP from 2007 to 2021 (MW)



## 2. An overview on electricity consumption, installed capacity and domestic generation in power sector in Albania

### Structure of installed capacity

- Still dominated by the hydro generation
- Vlora TPP with 97 MW installed capacity, not in operation
- Installed Photovoltaic generation capacity still at insignificant levels

Figure 11: Structure of installed capacity in 2009

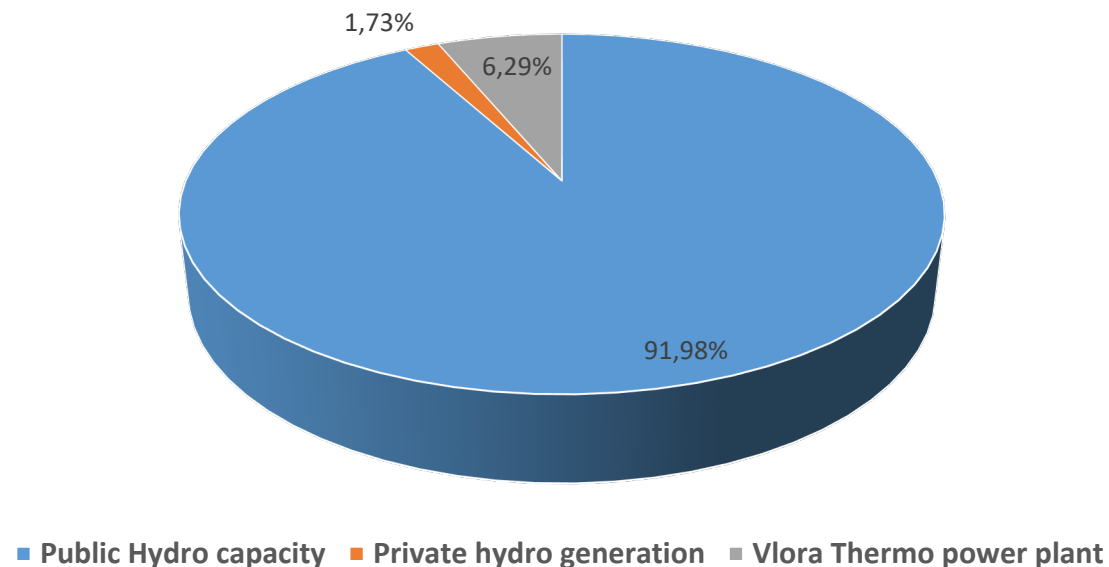
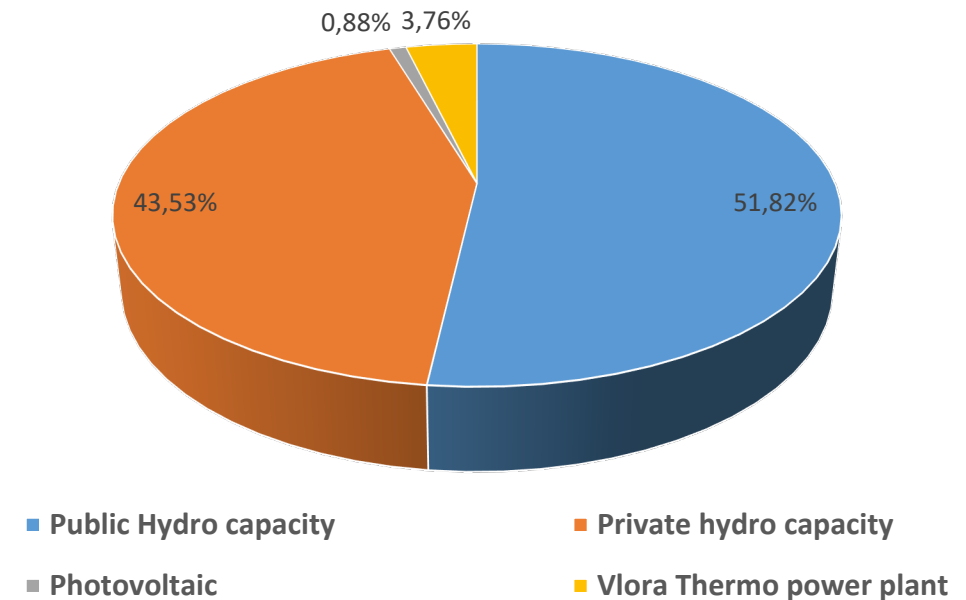


Figure 12: Structure of installed capacity in 2021

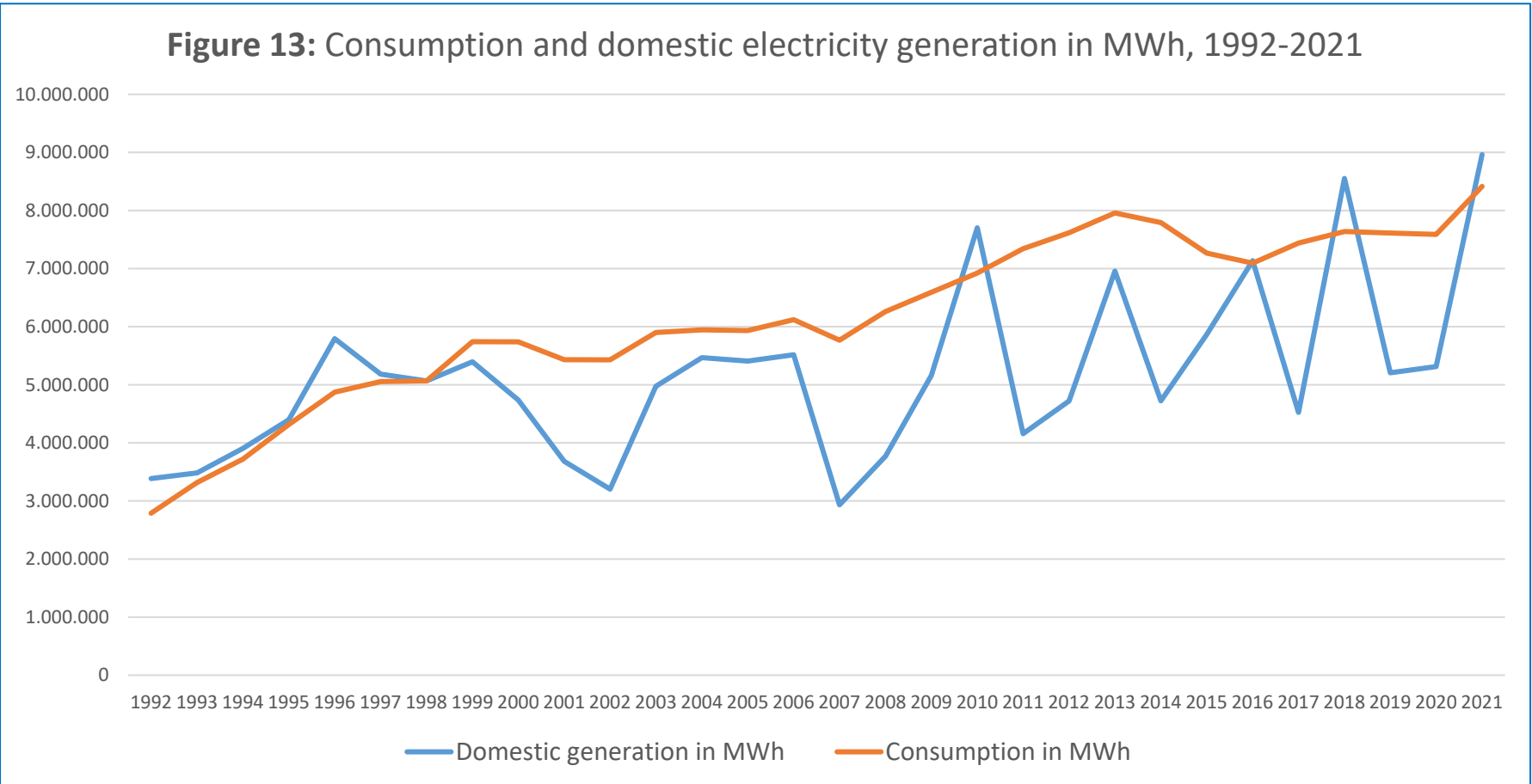




## 2. An overview on electricity consumption, installed capacity and domestic generation in power sector in Albania

### Consumption and domestic electricity generation (1992-2021)

- Since year 1998, Albania is a net importer of electricity
- Exception years 2010, 2018 and 2021

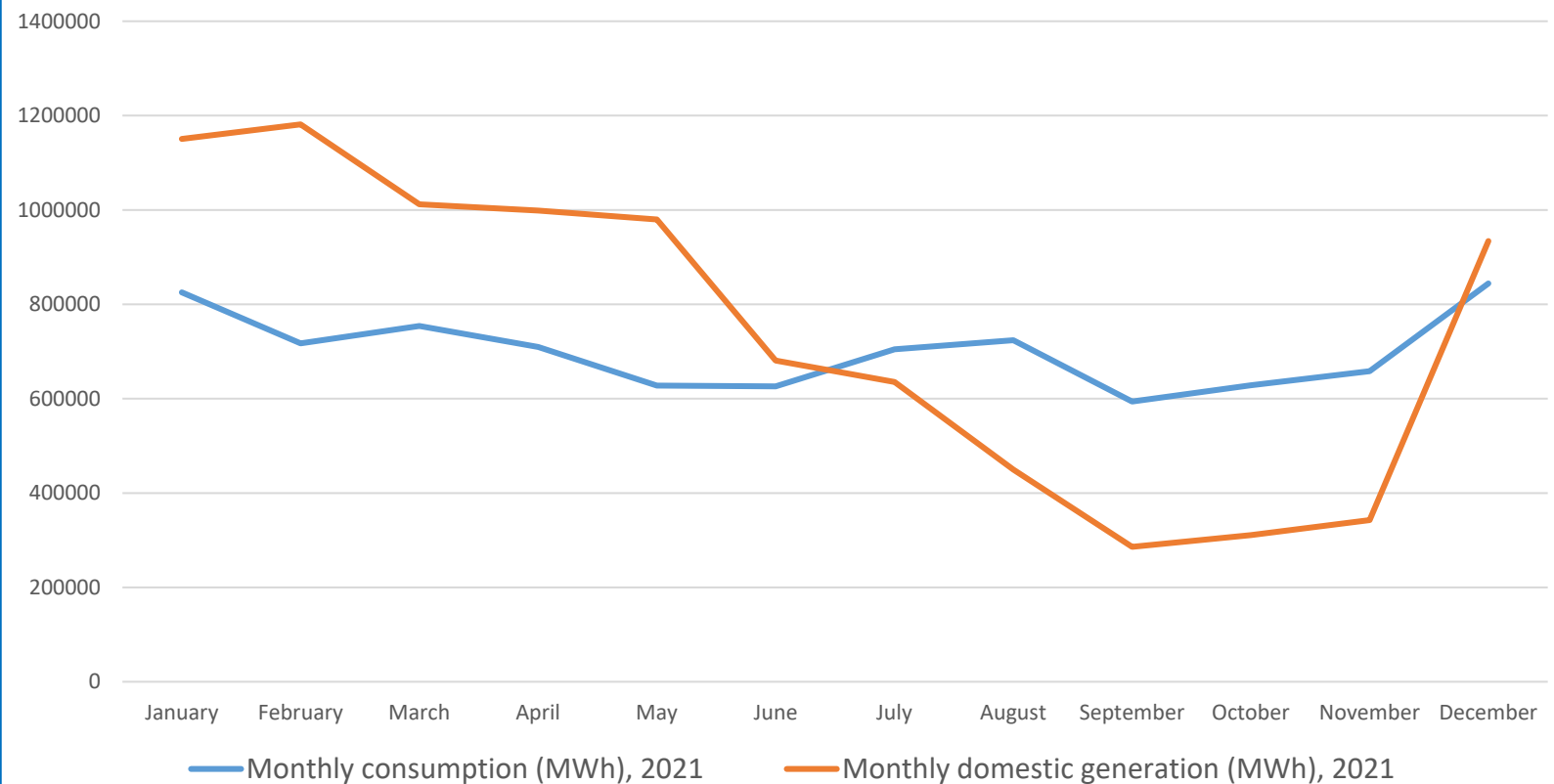


## 2. An overview on electricity consumption, installed capacity and domestic generation in power sector in Albania

### Monthly electricity consumption and domestic generation, during 2021

- In 2021, Albania was a net exporter
- Since July until December, consumption was well above domestic generation and electricity imports were necessary

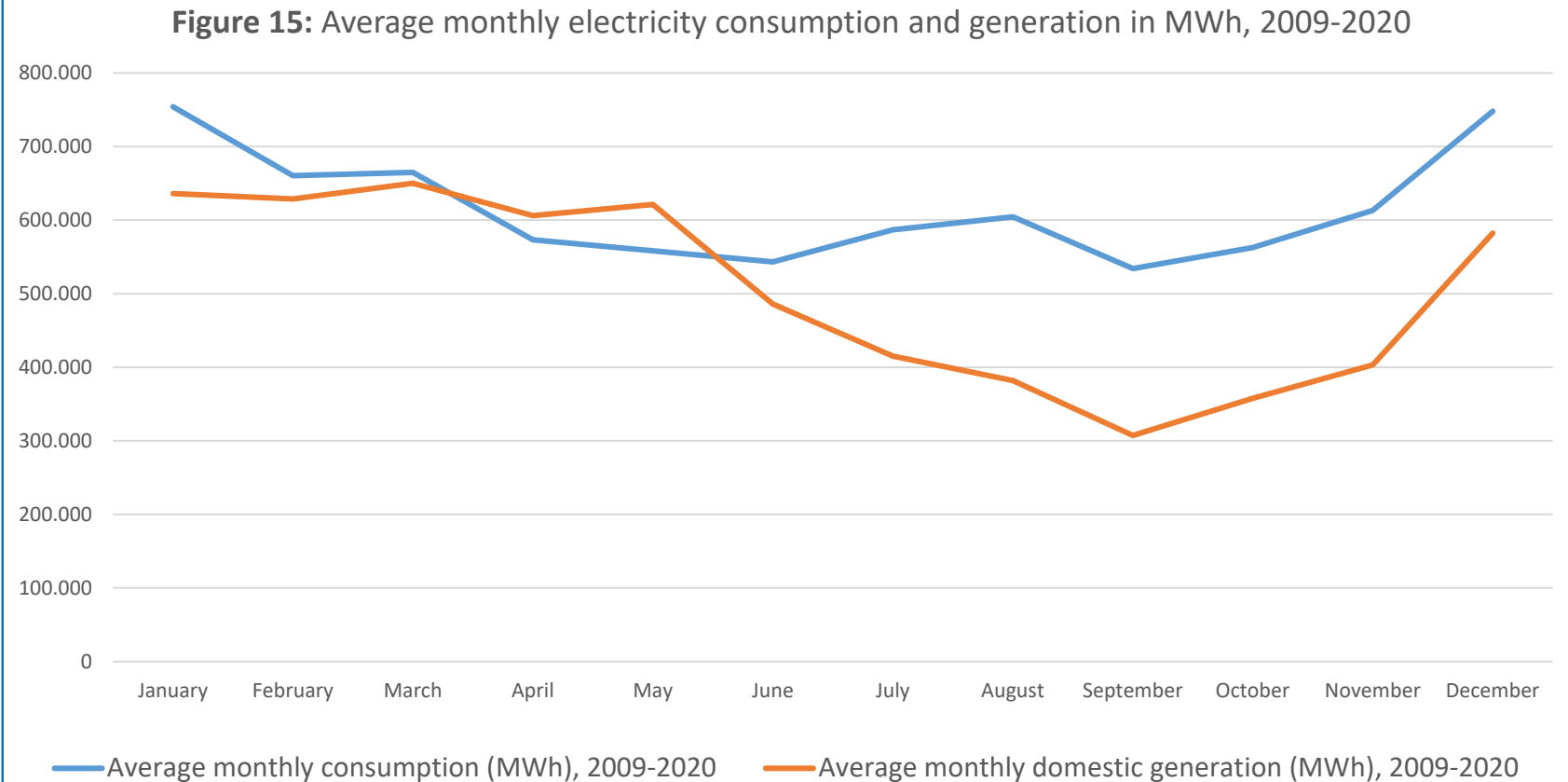
Figure 14: Monthly consumption and generation during 2021, in MWh



## 2. An overview on electricity consumption, installed capacity and domestic generation in power sector in Albania

### Monthly electricity consumption and generation, average year

- Consumption is well above domestic generation in January-February and June-December
- High dependency from imports for 8 to 9 months during an average year
- Situation is worse during a dry weather year



### 3. Demand forecast and plans for new capacity generation

## Electricity Demand forecast

- Four scenarios, TSO forecast until 2040
- Average annual growth rate (until 2030) for the first two scenarios is 3.7% and 3% respectively
- The anticipated average annual growth rate for the other two scenarios, with natural gas is 3% and 2%.

**Note:** Actual levels of electricity consumption in 2020 (**7.6 TWh**) and 2021 (**8.4 TWh**) are higher than the levels forecasted by the TSO

**Table 3:** Electricity demand forecast 2020-2040, in TWh

	2020	2023	2025	2028	2030	2033	2035	2040
High scenario (no natural gas)	7.17	8.17	8.48	9.3	9.86	10.9	11.58	13.44
High scenario with low population (no natural gas)	7.17	8.05	8.28	8.93	9.37	10.23	10.8	12.39
Moderate scenario (with natural gas)	7.17	8.07	8.32	8.92	9.34	10.07	10.55	11.91
Low scenario (with natural gas & low population growth)	7.17	7.89	8.02	8.41	8.69	9.23	9.59	10.44

### 3. Demand forecast and plans for new capacity generation

## Planned new capacities

- 224 MW are expected to start operation during 2022-2023 period
- While 1000 MW are planned to be constructed
- If all will be constructed by 2030, CAGR will be 3.9% (if HPP Skavica, 250 MW) included than CAGR is 4.5%)

Table 4: New capacities connected to HV (planned or in construction phase)	HPP in MW	Photovoltaic in MWp	Total
Installed capacity expected to start during 2022-2023 (connected to HV)	79.26	145.14	224.40
Approval in principal to connect in HV	22.00	180.20	202.20
Preliminary opinion to connect to HV		797.30	797.30
<b>TOTAL</b>	101.261	1122.64	<b>1223.90</b>

## 4. Conclusions

- **Increased electricity consumption** – since 2007 annual average growth rate is **2.6%**
- **Increased generation capacities** - since 2007 annual average growth rate of new generation capacities **3.75%**
- **Domestic generation and consumption of electricity diverge considerably** - exacerbate the security of supply
- **Still depending on hydro generation** - despite efforts made to increase generating capacity, especially after 2007
- **Planned new capacities are all RES** – and will require additional investment in transmission or distribution system
- **Demand forecast** - we expect electricity demand will at least follow GDP growth (it has done so for the last 30 years)
- **Security of supply still a big issue** – vulnerable to market fluctuations
- **Lack of diversification of domestic generation resources** – the main reason behind security of supply issue



## 4. Conclusions

### ➤ Providing that:

#### • **As a member of the Energy Community (EnC), Albania:**

- has to comply with all obligations vis-à-vis GHG emission reductions and market integration measures.

- Albania has to increase its RES generation capacity, especially from photovoltaics and windfarms.

- A generation portfolio with only RES will put the security of supply at risk and induce high electricity prices

- Market integration of EnC contracting parties, though desirable, will require time

- The majority of countries in the region are net electricity importers

### ➤ Immediate actions are needed to solve the trilema:

Finding a balance between:

**Security – Affordability - Sustainability**

## 5. Potential solutions

### ➤ **Building baseload thermal power production capacities with natural gas**

- In the context of the current crisis, Albania should start immediately diversify its generating portfolio by natural gas thermal generation
- Albania can take advantage from the presence of TAP that is already operational
- **Gas to power** - the optimal solution in medium to long term to diversify the electricity generation portfolio by providing base-load generation and mitigating the security of supply risk.

### **Key priorities:**

- **Putting Vlora power plant into operation using natural gas** - with the capacity of 97 MW, Vlora power plant can produce up to 770,000 MWh electricity annually,
- **Vlora TPP generation** - will contribute into minimizing the differences between consumption and hydro generation along the year
- **Building additional 300-400 MW CCGT capacity** - in medium to long term, will contribute to generate 2-3 TWh electricity annually, and therefore making Albania independent by imports of electricity.



## 5. Potential solutions

### ➤ Construction of LNG terminals

- Albania is not yet benefiting any gas from TAP - due to lack of necessary infrastructure
- Therefore, use of SSLNG technology - a great opportunity in the presence of the lack of any infrastructure
- Plans for the construction of a FSRU in Vlora - by the American companies, Exxelerate and ExxonMobil.
- The war in Ukraine and EU decision to break gas supplies from Russia, makes the construction of this terminal of a greater importance.



## 5. Potential solutions

### ➤ **Construction of gas infrastructure**

- **Building gas infrastructure** - important to increase penetration of natural gas in medium to long term in Albania.
- **Building the pipeline from Vlora to TAP entry point in Fier is imperative** - In fact, Vlora-Fier pipeline should have been built in parallel during TAP construction
- **Giving support to the construction of IAP**- should be a priority for the Albanian government, in medium to long term.

### ➤ **Sustainability of any new investment**

- Albania should be cautious when constructing any new investment in the energy sector
- Natural gas is the cleanest fossil fuel while gas fired power plants enable the development of power generation from RES
- Any new investment in gas infrastructure should be designed to serve in the future for the transportation of hydrogen generated by RES or biogases



## 5. Potential solutions

### ➤ **Energy efficiency measures**

- Energy efficiency measures should go hand to hand with all above-mentioned measures.
- **Proper incentives and mechanisms to increase the energy efficiency** - this will impact the growth of electricity demand.

### ➤ **Market liberalization and market integration**

- **Starting operation of power exchange** - necessary in creating the conditions for a fair and competitive electricity market
- **A functioning power exchange** - is expected to put a downward pressure on electricity prices.
- **Market integration** - important in helping countries to cope with the security of supply risk
- **Providing the differences in rules and regulations between countries in the region** - will require time for market integration, but remains achievable in the medium to long term.

# THANK YOU!

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