

## Cryptomining and the electricity sector in Georgia

**Cryptomining in Georgia is dominated by professional companies, which are attracted by low electricity prices. Electricity consumption in this industry is volatile and highly affected by global trends: in summer 2019, cryptomining accounted for up to 14.1% of total electricity consumption. This declined to a low of 0.4% in autumn 2020. Currently, the sector consumes around 6% of total consumption. Cryptomining contributed to rising electricity imports, mainly generated from fossil fuels.**

**Profits from January to September 2021 are estimated at USD 44 m, equal to 0.3% of GDP. They are mostly tax-exempt. Few workers are employed in the sector.**

**Overall, it can be said for cryptomining that the economic costs in the form of volatile electricity demand are significantly higher than the economic benefits.**

### Overview

Cryptocurrencies have experienced a strong boom in recent years. The discussion has focussed mainly on the financial implications. However, as cryptocurrencies have to be “mined” using electricity, they have implications for the real sector as well. In a previous study, the German Economic Team had estimated that cryptomining accounted for 6% of total electricity consumption (excl. Abkhazia) and 1.2% of GDP in 2017. More detailed data by the Georgian Electricity System Commercial Operator (ESCO) starting from May-18 and the Cambridge Bitcoin Electricity Consumption Index (CBECI) now allow for further insights.

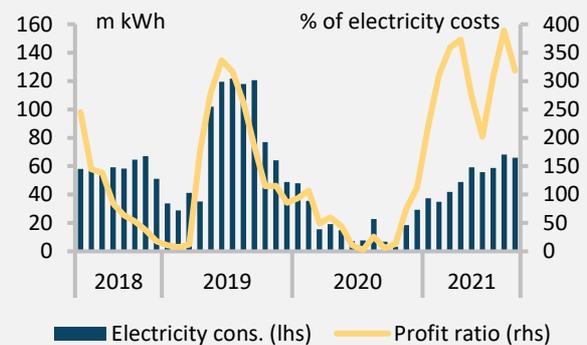
Cryptomining can be differentiated into professional (i.e. commercial) and private mining (by households). In Georgia, professional mining dominates, accounting for approx. 80-90% of the total. Within this group, BFDC Georgia stands out with a share of more than 80% for most of the analysed time-span.

### Development of electricity consumption

Looking at the monthly electricity consumption due to cryptomining reveals sizeable volatility. This can be explained by looking at mining profitability, which is determined by the bitcoin price, network capacity (a measure for competition by other miners), electricity costs and hardware efficiency. Georgia is an attractive location due to its low electricity price (approx. 0.05 USD per kWh). Combining these factors (and ignoring other costs such as hardware), it is possible to derive an estimate for gross profitability of cryptomining. The

resulting profit indicator correlates well with the data on electricity consumption.

### Electricity consumption due to cryptomining by month



Sources: German Economic Team, ESCO, CBECI, blockchain.com  
Note: Each bar corresponds to one month, starting in May-18. Electricity consumption is the total of professional and private mining.

Electricity consumption was relatively stable from May-Dec 2018 (approx. 6.6% of total consumption excl. Abkhazia). In 2019, it was particularly high in the summer (up to 14.1%) and averaged 8.5% for the full year. In 2020, various negative factors led to very limited activity, which reached a low of 0.4% in autumn. The price surge starting in late 2020 led to a resumption. Currently, cryptomining accounts for roughly 6.0%. The data suggest that some hardware was sold or discontinued after 2019 (as the recent rise should otherwise be stronger).

### Summarized electricity consumption of cryptomining

	May - Dec 2018	2019	2020	Jan - Sep 2021
% of total	6.6	8.5	2.4	6.0
Min / Max	5.5 / 7.6	3.5 / 14.1	0.4 / 5.2	4.3 / 7.6
m kWh	471	910	228	471

Sources: German Economic Team, ESCO, CBECI  
Note: % of total excludes Abkhazia

While Georgia’s electricity is mainly produced through hydropower (2020: 65% of total supply), it should be noted that 12% of the electricity is imported. Since 2017, Georgia is a net importer of electricity. The rise in cryptomining thus coincides with the rise in imports. As electricity is imported from Azerbaijan, Russia and Turkey, all of which generate electricity primarily from fossil fuels, cryptomining in Georgia has a negative environmental impact.

## Profits from cryptomining

Using assumptions on the efficiency of the utilised hardware, it is possible to estimate the profitability of cryptomining. Revenues follow a similar pattern as electricity consumption. The main costs are electricity and hardware (depreciation). Note that mining is still profitable, even if net profits are negative because hardware costs represent sunk investment costs and revenues exceed other costs. From January to September 2021, profits amounted to an estimated USD 44 m, equivalent to 0.3% of GDP.

### Estimated contribution to GDP

(USD m)	May - Dec 2018*	2019	2020	Jan - Sep 2021
Revenue	47	140	19	96
Electricity	-24	-46	-13	-24
Hardware	-31	-48	-30	-22
Other	-3	-5	-5	-4
<b>Profits</b>	<b>-11</b>	<b>38</b>	<b>-29</b>	<b>44</b>
GDP	13,739	17,471	15,888	13,709
<b>% of GDP</b>	<b>-0.1</b>	<b>0.2</b>	<b>-0.2</b>	<b>0.3</b>

Sources: German Economic Team, Geostat; \*GDP data for Q2 to Q4

Profits are largely tax-exempt, as the largest company BFDC Georgia is located in the Tbilisi Free Zone. The impact on the labour market is very limited: in 2019, BFDC Georgia employed 72 people on average.

## Cryptomining in Abkhazia

Cryptomining is particularly important in the region of Abkhazia, where the cost of electricity is only 10% of the (already low) price in the rest of Georgia. For 2020, local power company Chernomorenergo estimated that at least 40-45 MW of cryptomining equipment was operating in the region. If these facilities are used 24/7, they would consume about 400 m kWh of electricity, or 15.5% of total consumption. Even assuming the use of older, less efficient hardware (which can be run profitably due to very low prices), profits are remarkable.

Cryptomining is blamed for contributing to electricity blackouts. The de-facto authorities therefore extended the ban on cryptomining until March 2022. However, the ban will be hard to enforce due to the high profitability and spatial scattering of the hardware.

### Lower estimate of cryptomining in Abkhazia for 2020

<b>Electricity consumption</b>	
m kWh / % of total consumption	<b>395.3 / 15.5</b>
<b>Gross profits</b>	
Gross profits (USD m) / % of 2019 GDP	<b>13.4 / 2.5</b>

Sources: German Economic Team, ESCO, Chernomorenergo, State Committee of the Republic of Abkhazia on Statistics. Note: Gross profits equal revenue minus electricity costs; share of GDP based on 2019 data, as more recent data currently not available

## Outlook

In the short run, cryptomining is likely to continue at current levels, because even older hardware can currently be run profitably as long as the bitcoin price remains above USD 22,000. In the long run, this hardware will become economically unviable. Renewing or expanding the hardware is difficult due to strong global demand and high prices.

Overall, cryptomining has a strong effect on the Georgian electricity market and creates volatility for the system. The rise of cryptomining arguably contributed to the rise in electricity imports in recent years, which are mainly produced by fossil fuels. At the same time, tax revenues associated with cryptomining are very low. The problems for the electricity sector are much more substantial than the economic benefits.

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This newsletter is based on the Policy Study "[Development of cryptomining in Georgia 2018-2021](#)". Our [Electricity Monitor Georgia 2021](#) offers a general overview of the sector.

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