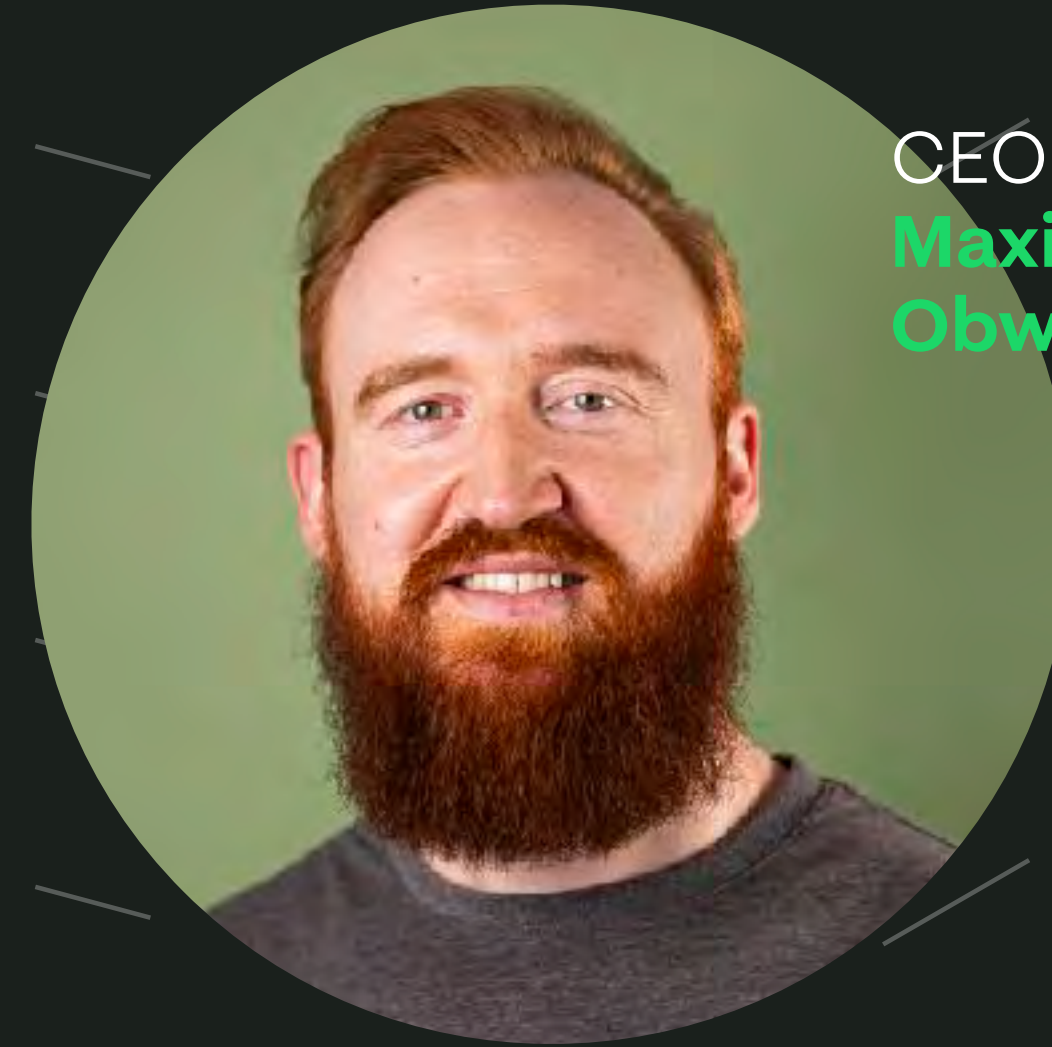


# Bitcoin and Energy.

who was  
supposed to do  
the talk ...



CEO  
Maximilian  
Obwexer

# who is filling in ...



CTO  
**Matthias  
Triendl**

# who is filling in ...



CTO  
Matthias  
Triendl

florianmatthias

# Full Service Digital Agency



# 1. Bitcoin and Energy

**1. Bitcoin and Energy**

**2. Tech, Hardware, Software**

**1. Bitcoin and Energy**

**2. Tech, Hardware, Software**

**3. Outlook, what we're working on**

- 1. Bitcoin and Energy**
- 2. Tech, Hardware, Software**
- 3. Outlook, what we're working on**
- 4. Questions**



**Assumption:**  
**Bitcoin is valuable!**

# Bitcoin Price History Chart (since 2009)



# What is Bitcoin Mining?

**Bitcoin Mining is  
thermodynamically securing  
the bitcoin network.**

It's the anchor to the physical world.

# Proof of Work

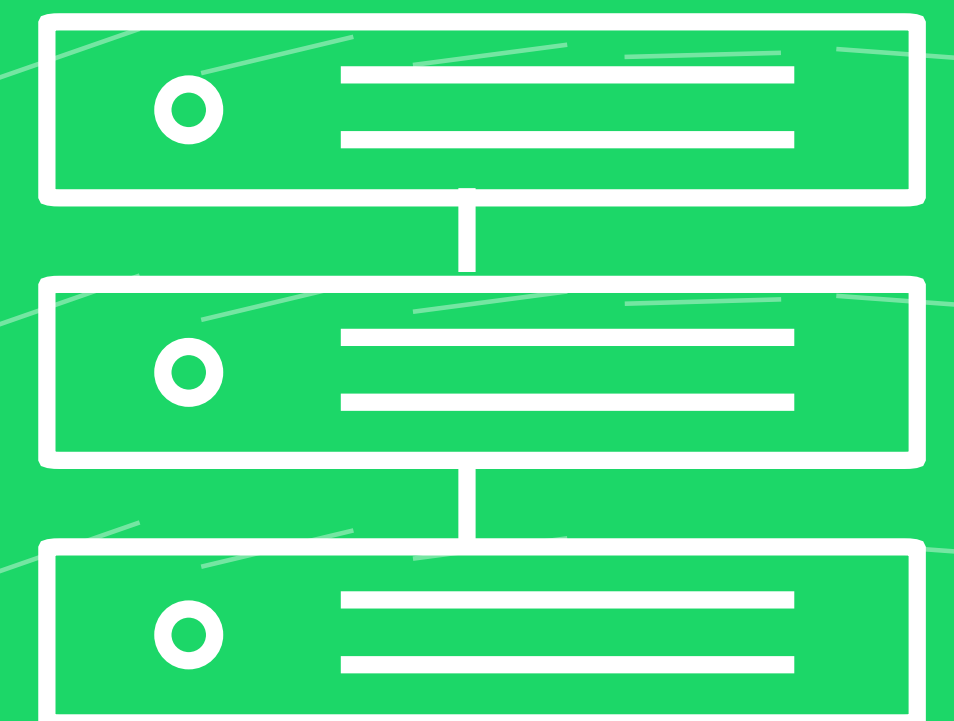


**Everyone gets paid the same  
for the same work.**

**Without Mining no Bitcoin.**

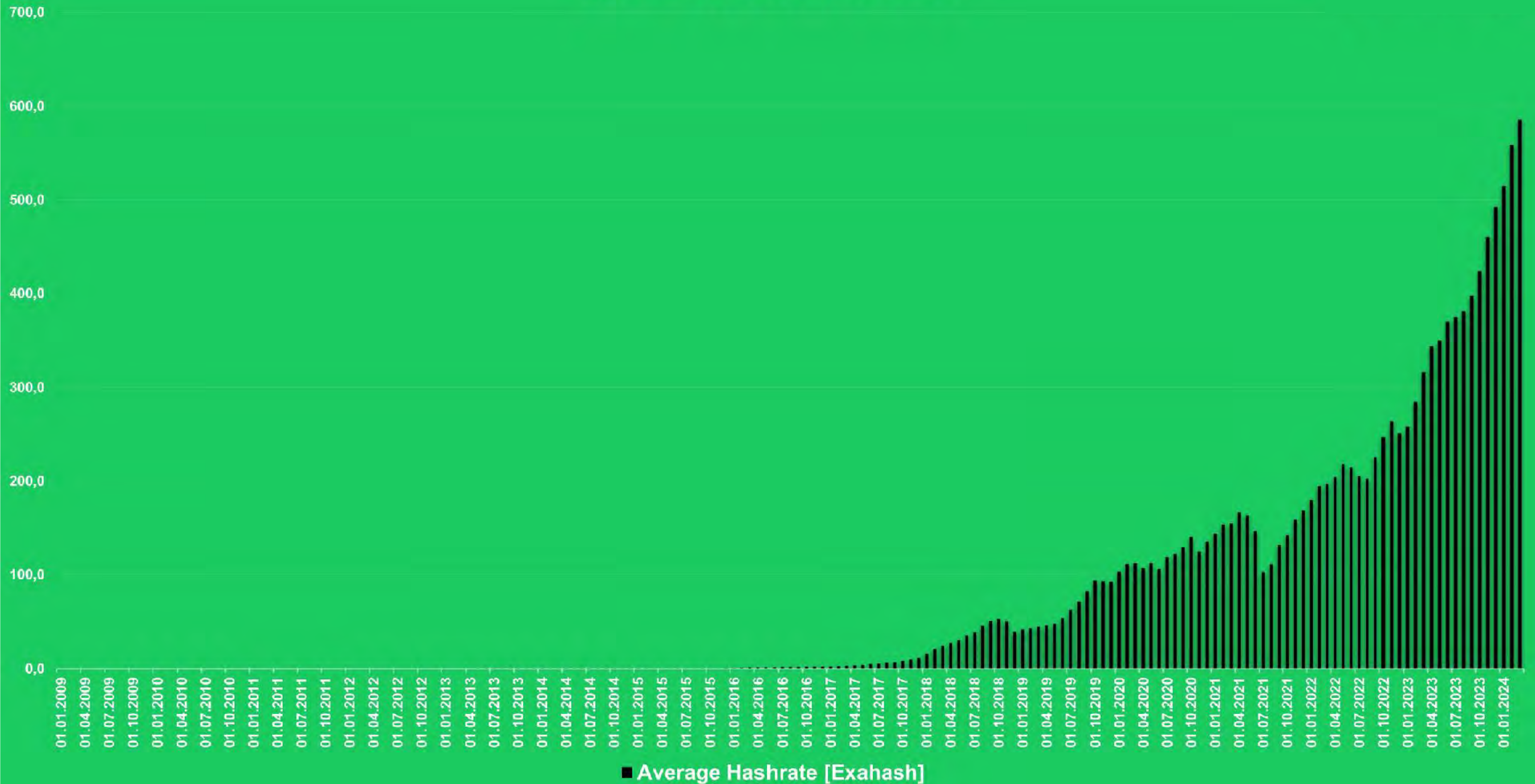
# Bitcoin Mining

- ✓ Responsible for validating transactions
- ✓ Miners assemble the next Bitcoin block
- ✓ Miners calculate cryptographic hashes and search for the correct one
- ✓ Miners receive newly created bitcoins and transaction fees as a reward





# ₿ BTC HASHRATE



# 600 Exahash

**600 Exahash**

**600.000.000.000.000.000.000**

**600 Exahash**

**600.000.000.000.000.000.000**

**600 quintillion calculations / s**

**000000000000000000000003  
20283a032748cef8227873ff  
4872689bf23f1cda83a5**

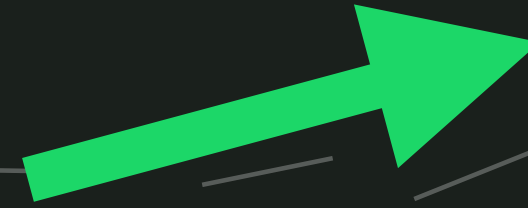
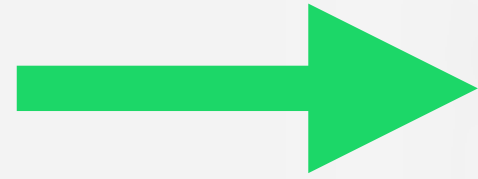


# ASIC

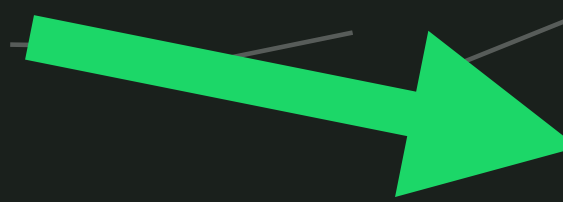
# application-specific integrated circuit

200 trillion calculations / second

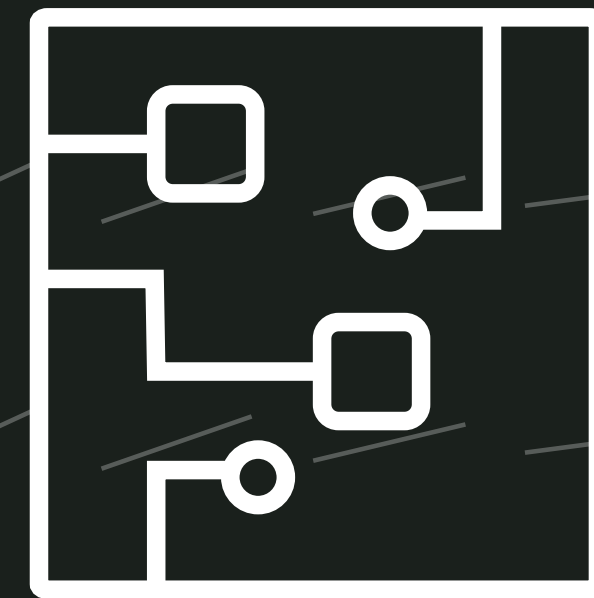
100% Electrical  
Power



100% Heat



100% Computing



**Mining farms and data centers  
expend additional energy to get  
rid of this “waste heat”.**



**What if ...**

**we use this “waste heat” to  
heat our homes or buildings?**

**What if ...**

**we use this “waste heat” to  
heat our homes or buildings?**



**Does this even  
make sense?**



yes\*

# Example: Austrian one-family home

03.2024



## Bitcoin Heizen Rentabilitätsrechner

### Rohstoffpreise

Strompreis [€/kWh]	0,260 €
Heizölpreis [€/Liter] - 9,8 kWh/Liter	1,280 €
Gaspreis [€/kWh]	0,120 €
Bitcoin Mining Profitability [€/TH/Tag] - Durchschnittswert der letzten 48 Monate	0,137 €

### Wirkungsgrade

Wirkungsgrad Ölheizung [%]	70%
Wirkungsgrad Gasheizung [%]	80%
Wirkungsgrad Stromheizung [%]	100%
Wirkungsgrad Bitcoin Heater [%]	100%
Wirkungsgrad Bitcoin Heater mit Autotuning [Joule/TH]	20,0

### Energiebedarf

Jährlicher Wärmebedarf [kWh] - Einfamilienhaus 120 m <sup>2</sup>	16 500
---	--------

### Ausgaben Heizkosten

Heizöl Heizung	3 078,72 €
Gasheizung	2 475,00 €
Bitcoin Heater	4 290,00 €
Stromheizung	4 290,00 €

### Einnahmen

Heizöl Heizung	- €
Gasheizung	- €
Bitcoin Heater	4 711,87 €
Bitcoin Heater - Cashback pro kWh	0,286 €
Stromheizung	- €

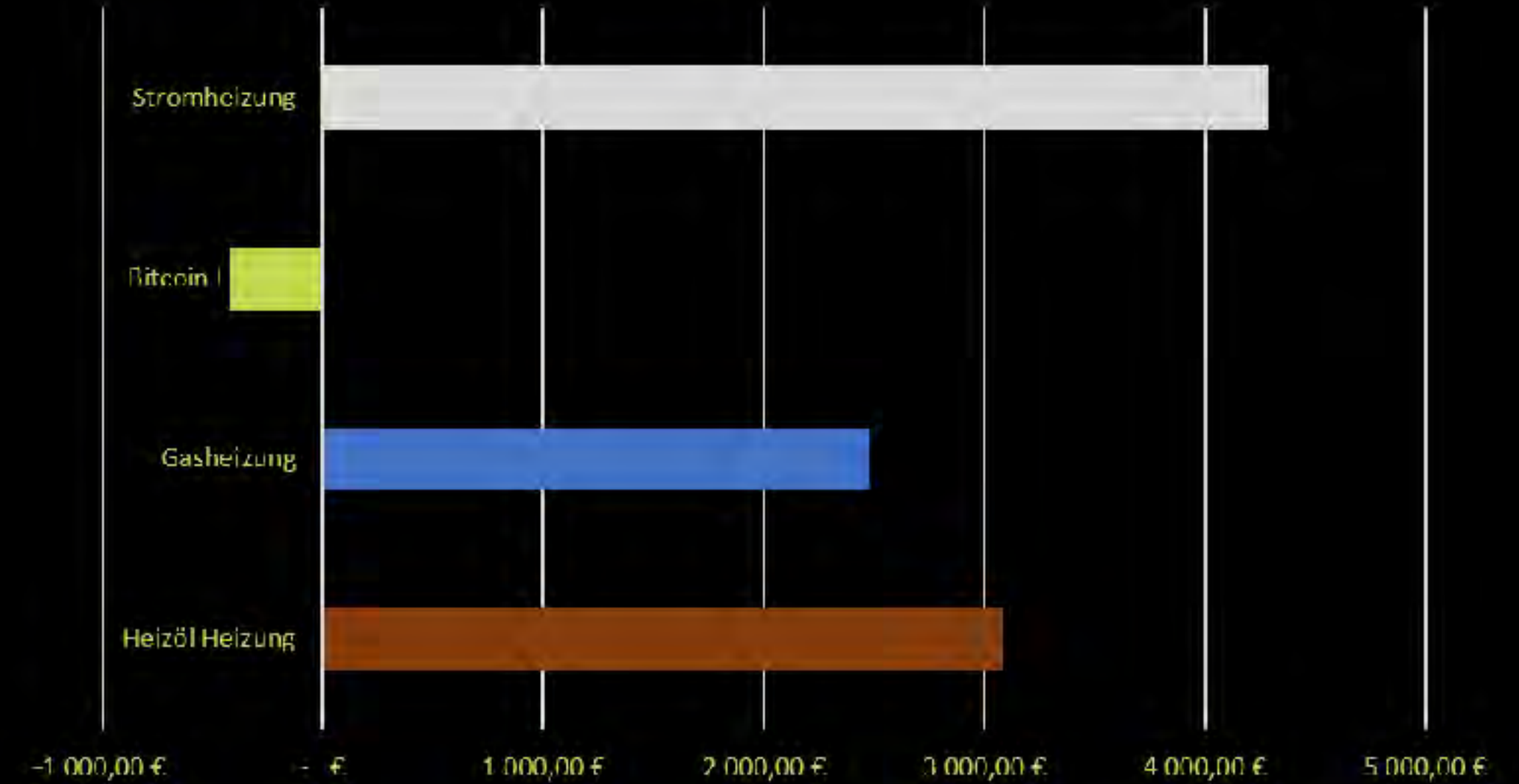
### Tatsächliche Heizkosten

Heizöl Heizung	3 078,72 €
Gasheizung	2 475,00 €
Bitcoin Heater	- 421,87 €
Stromheizung	4 290,00 €

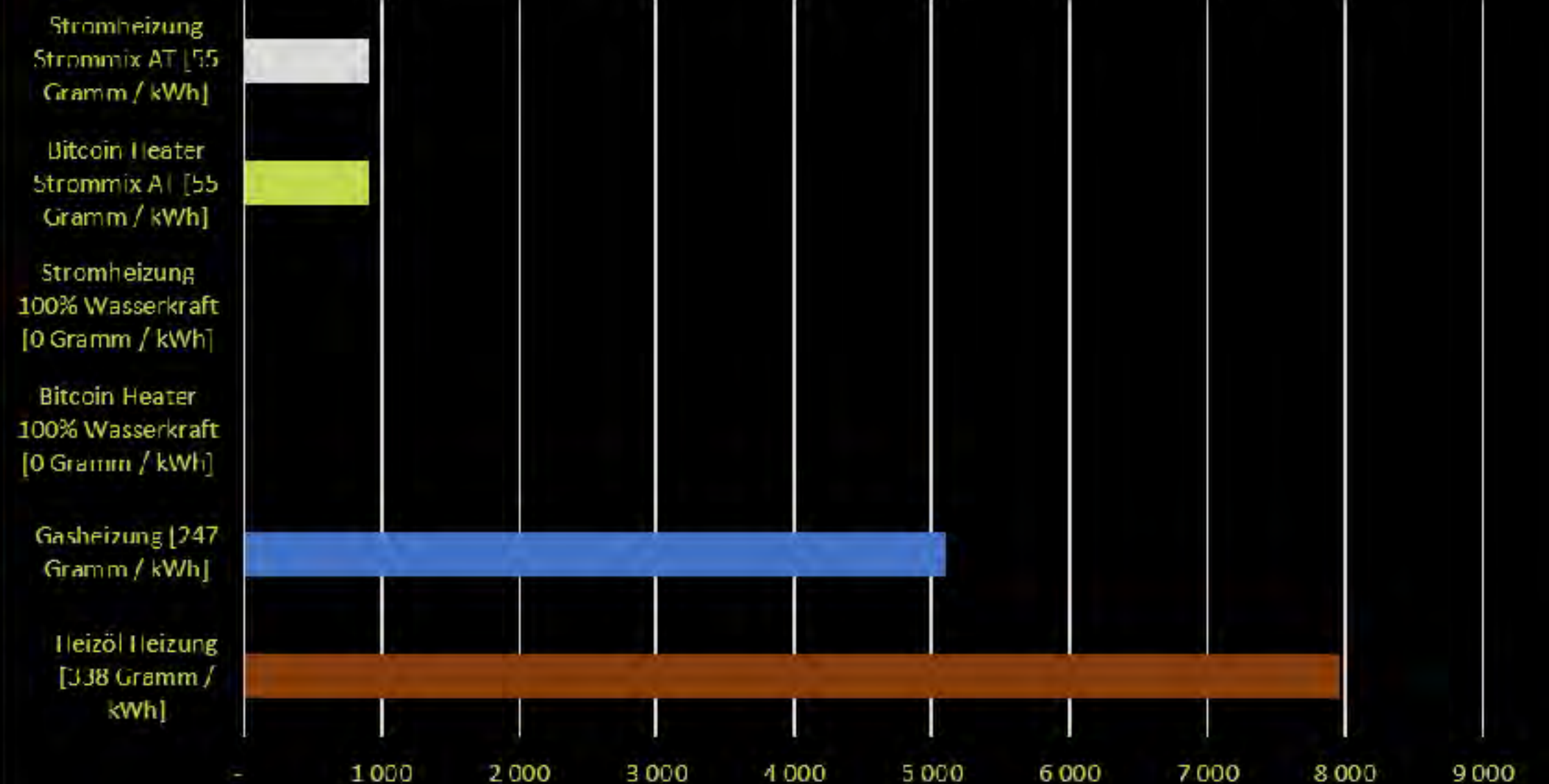
### CO2 Ausstoß

	[kg]
Heizöl Heizung [338 Gramm / kWh]	7 961
Gasheizung [247 Gramm / kWh]	5 094
Bitcoin Heater 100% Wasserkraft [0 Gramm / kWh]	-
Stromheizung 100% Wasserkraft [0 Gramm / kWh]	-
Bitcoin Heater Strommix AT [55 Gramm / kWh]	908
Stromheizung Strommix AT [55 Gramm / kWh]	908

## Heizkosten



## CO2 Ausstoß [kg]



# Example: Norwegian one-family home

03.2024



## Bitcoin Heizen Rentabilitätsrechner

### Rohstoffpreise

Strompreis [€/kWh]	0,113 €
Heizölpreis [€/Liter] - 9,8 kWh/Liter	1,130 €
Gaspreis [€/kWh]	0,120 €
Bitcoin Mining Profitability [€/TH/Tag] - Durchschnittswert der letzten 48 Monate	0,137 €

### Wirkungsgrade

Wirkungsgrad Ölheizung [%]	70%
Wirkungsgrad Gasheizung [%]	80%
Wirkungsgrad Stromheizung [%]	100%
Wirkungsgrad Bitcoin Heater [%]	100%
Wirkungsgrad Bitcoin Heater mit Autotuning [Joule/TH]	20,0

### Energiebedarf

Jährlicher Wärmebedarf [kWh] - Einfamilienhaus 120 m <sup>2</sup>	16 500
---	--------

### Ausgaben Heizkosten

Heizöl Heizung	2 717,93 €
Gasheizung	2 475,00 €
Bitcoin Heater	1 864,50 €
Stromheizung	1 864,50 €

### Einnahmen

Heizöl Heizung	- €
Gasheizung	- €
Bitcoin Heater	4 711,87 €
Bitcoin Heater - Cashback pro kWh	0,286 €
Stromheizung	- €

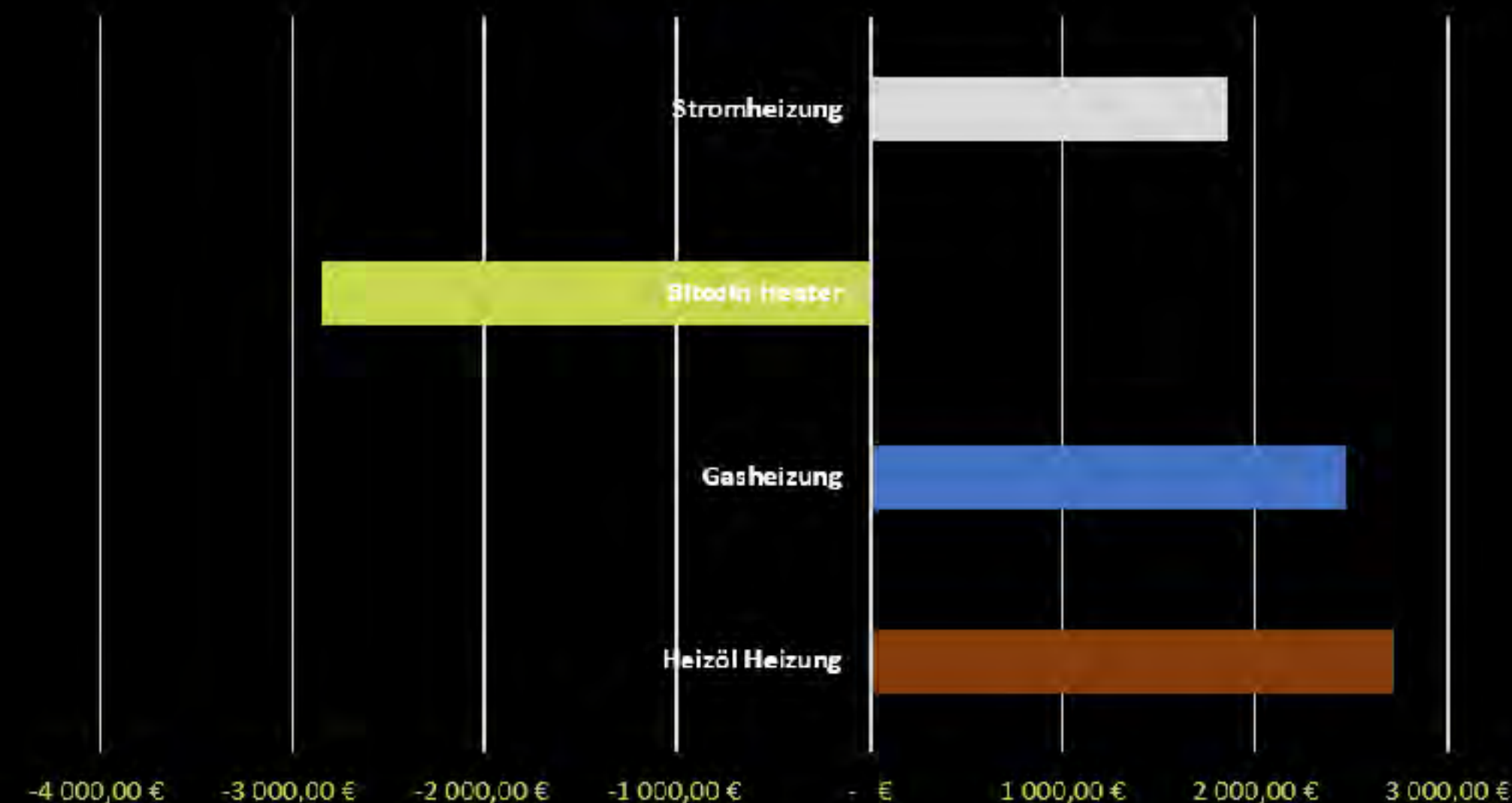
### Tatsächliche Heizkosten

Heizöl Heizung	2 717,93 €
Gasheizung	2 475,00 €
Bitcoin Heater	- 2 847,37 €
Stromheizung	1 864,50 €

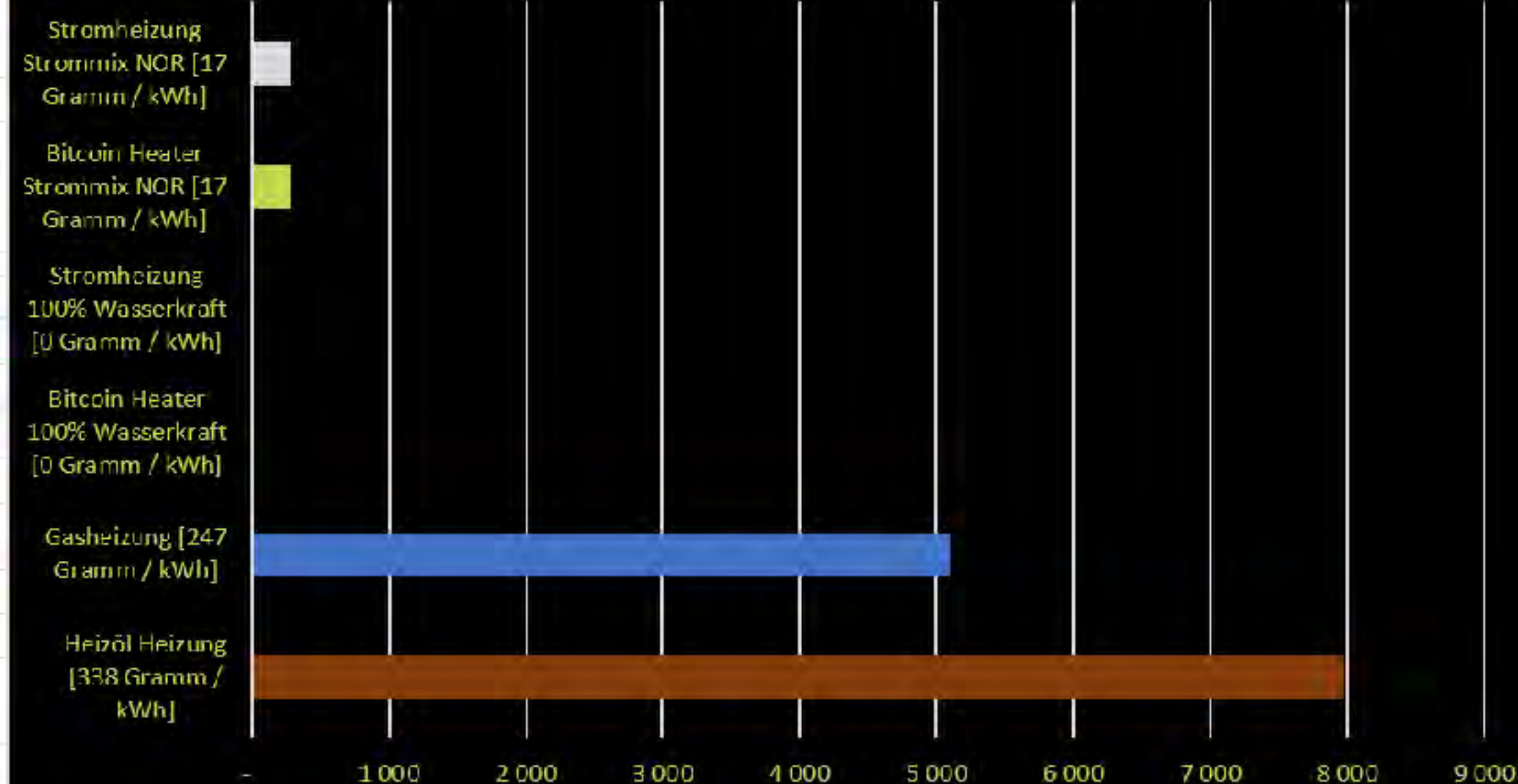
### CO2 Ausstoß

	[kg]
Heizöl Heizung [338 Gramm / kWh]	7 961
Gasheizung [247 Gramm / kWh]	5 094
Bitcoin Heater 100% Wasserkraft [0 Gramm / kWh]	-
Stromheizung 100% Wasserkraft [0 Gramm / kWh]	-
Bitcoin Heater Strommix NOR [17 Gramm / kWh]	281
Stromheizung Strommix NOR [17 Gramm / kWh]	281

## Heizkosten



## CO2 Ausstoß [kg]



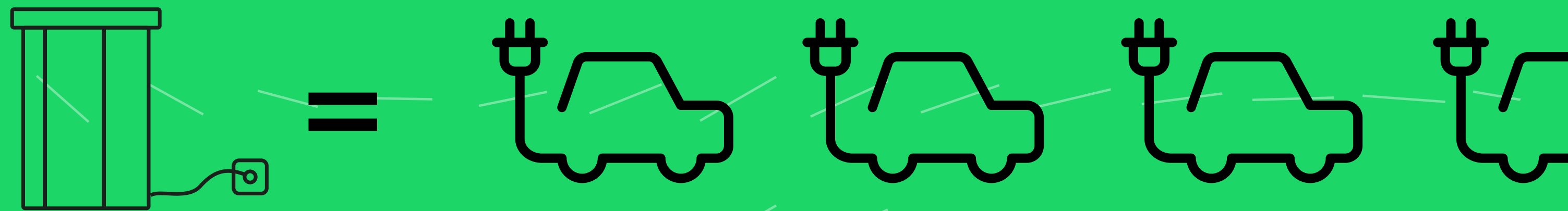


# Example: Swimming Pool in Innsbruck. Power to Heat.



# Electric mobility vs. Bitcoin Heating

- ✓✓ CO2 Mitigation-Equivalent
- ✓✓ Lower CO2 footprint
- ✓✓ Lower acquisition costs
- ✓✓ Gentler on the power grid



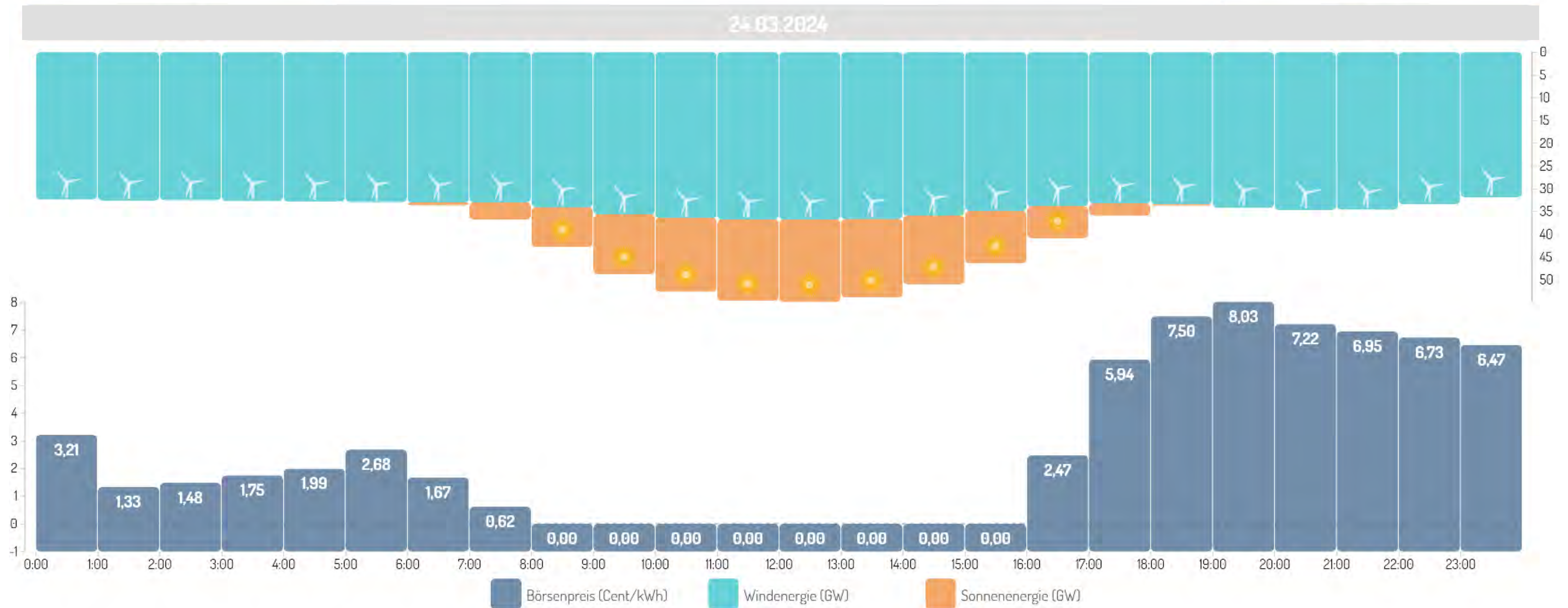
**The energy transition is the electrification of everything.**



**Renewable energy**  
= more grid volatility

**Can Bitcoin heaters and miners be grid-friendly?**

# Can Bitcoin heaters and miners be grid-friendly?



# Linkage to variable electricity tariffs

1. Bitcoin and Energy 

**2. Tech, Hardware, Software**



1. Bitcoin and Energy 

2. Tech, Hardware, Software

**Attention  
Product  
Placement**



**Bitcoin mining is loud**

**~90 db**



# Antminer s19



**40 TH/s**

**1.1 kW**

**~35 db**

**~29 c**



**40 TH/s**  
**1.1 kW**  
**~35 db**  
**~29 c**





**40 TH/s**

**1.1 kW**

**~35 db**

**~29 c**

**Plug  
& Play**





Search

Discover

Arcade

Create

Work

Play

Develop

Categories

Updates

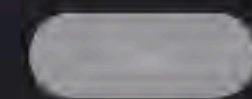


Not compatible with this device. [See full list of compatible devices.](#)



# 21energy

Heater Setup and Configuration



AGE

4+

Years Old

CATEGORY



Utilities

DEVELOPER



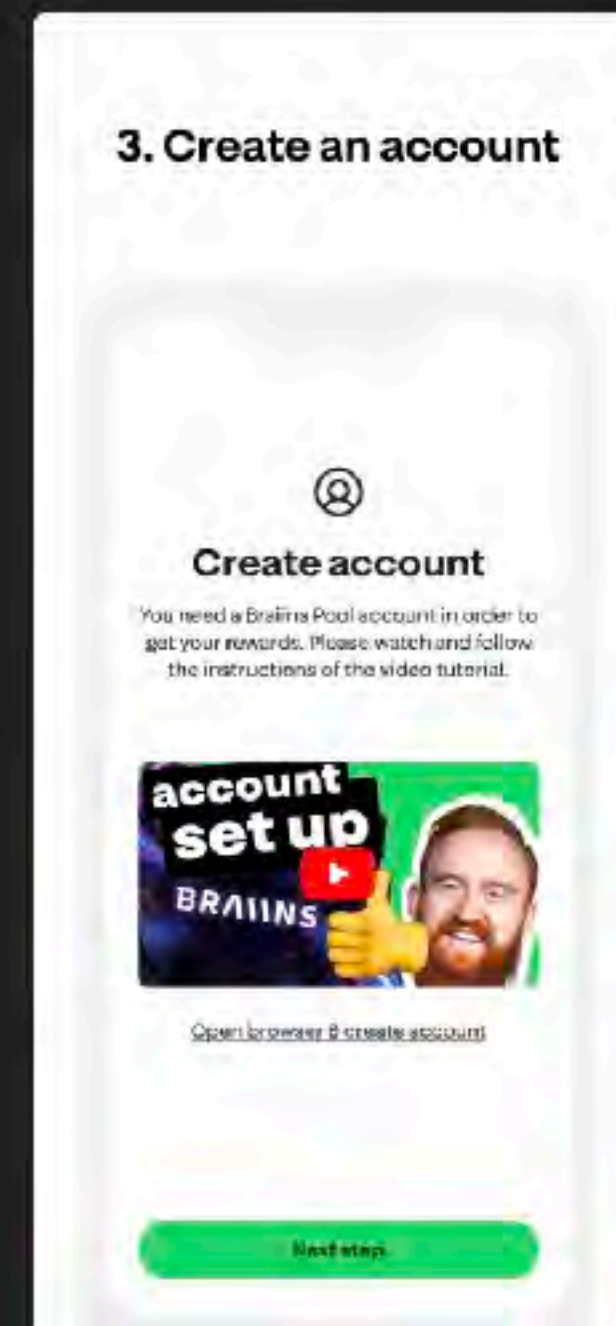
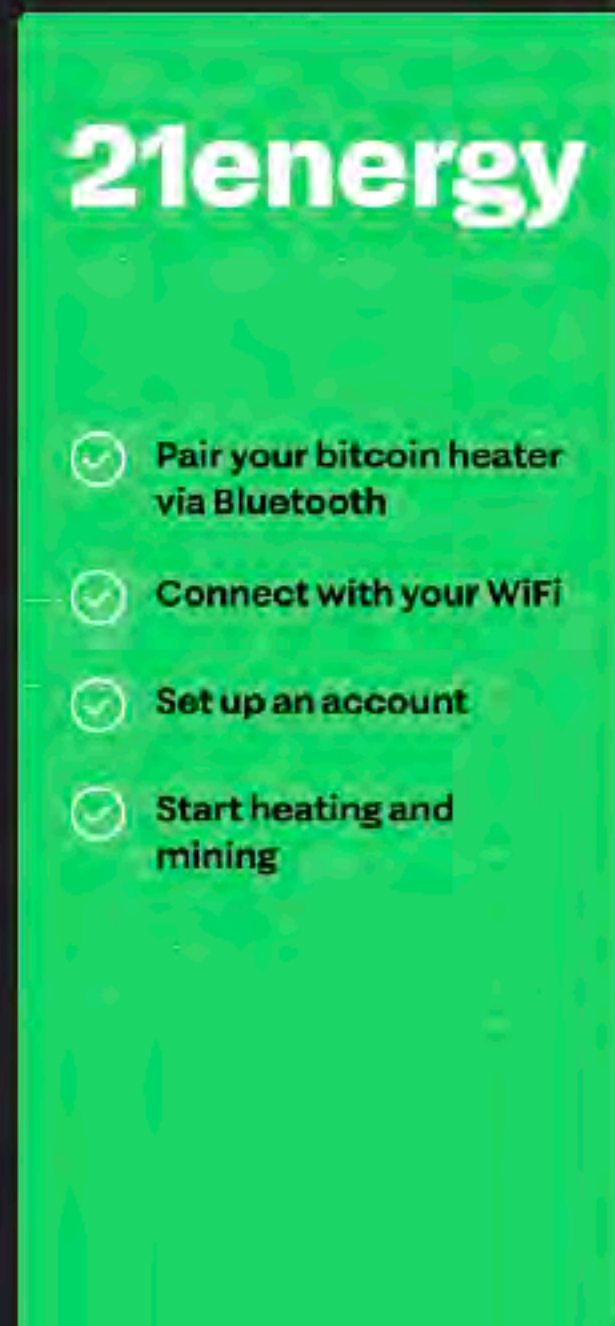
21energy GmbH

LANGUAGE

EN

English

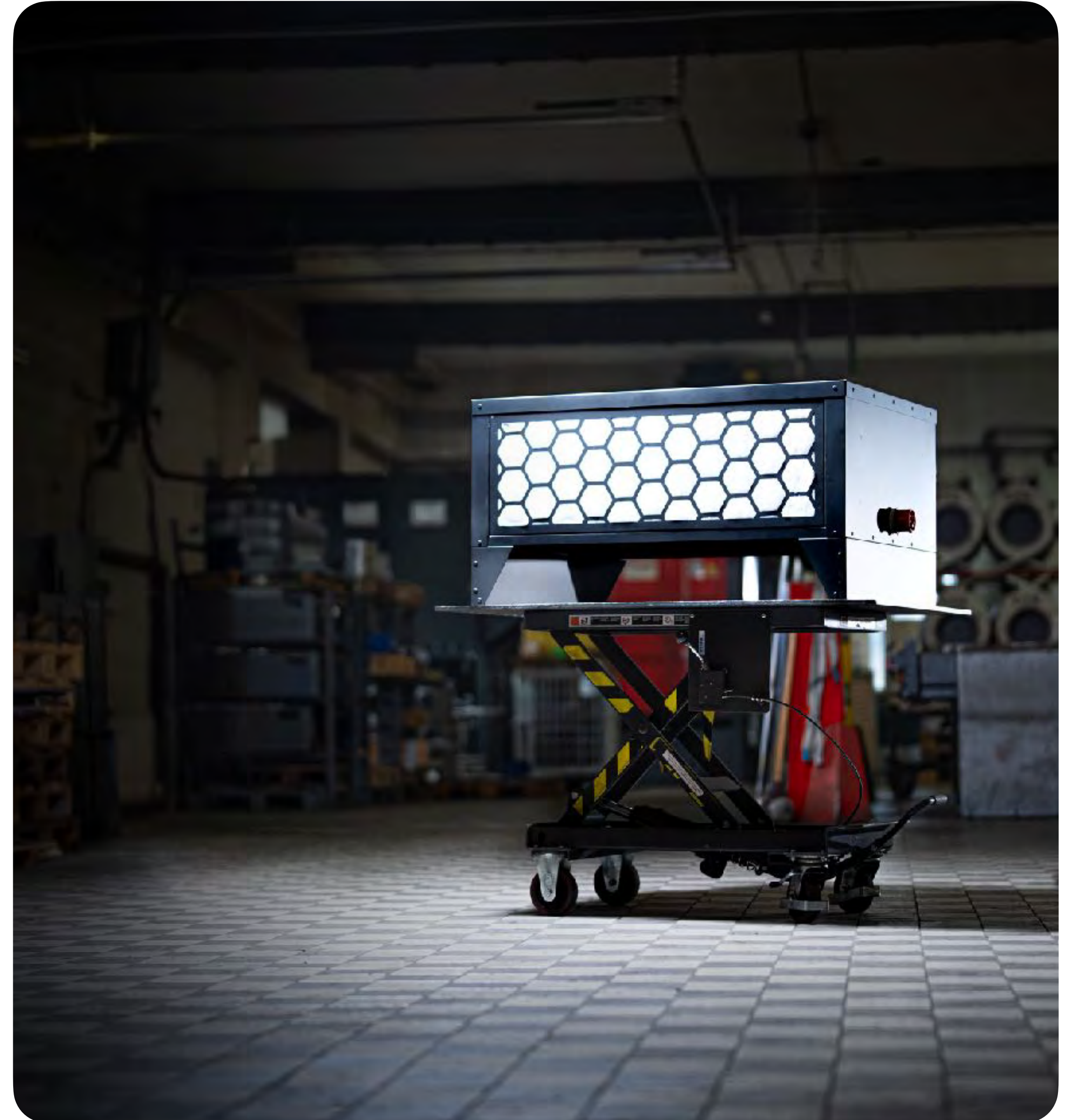
Only on iPhone



Matthias Triendl



**The same with 3  
Antminer s19  
kPro's and 9 kW  
heating 300 m<sup>2</sup>**



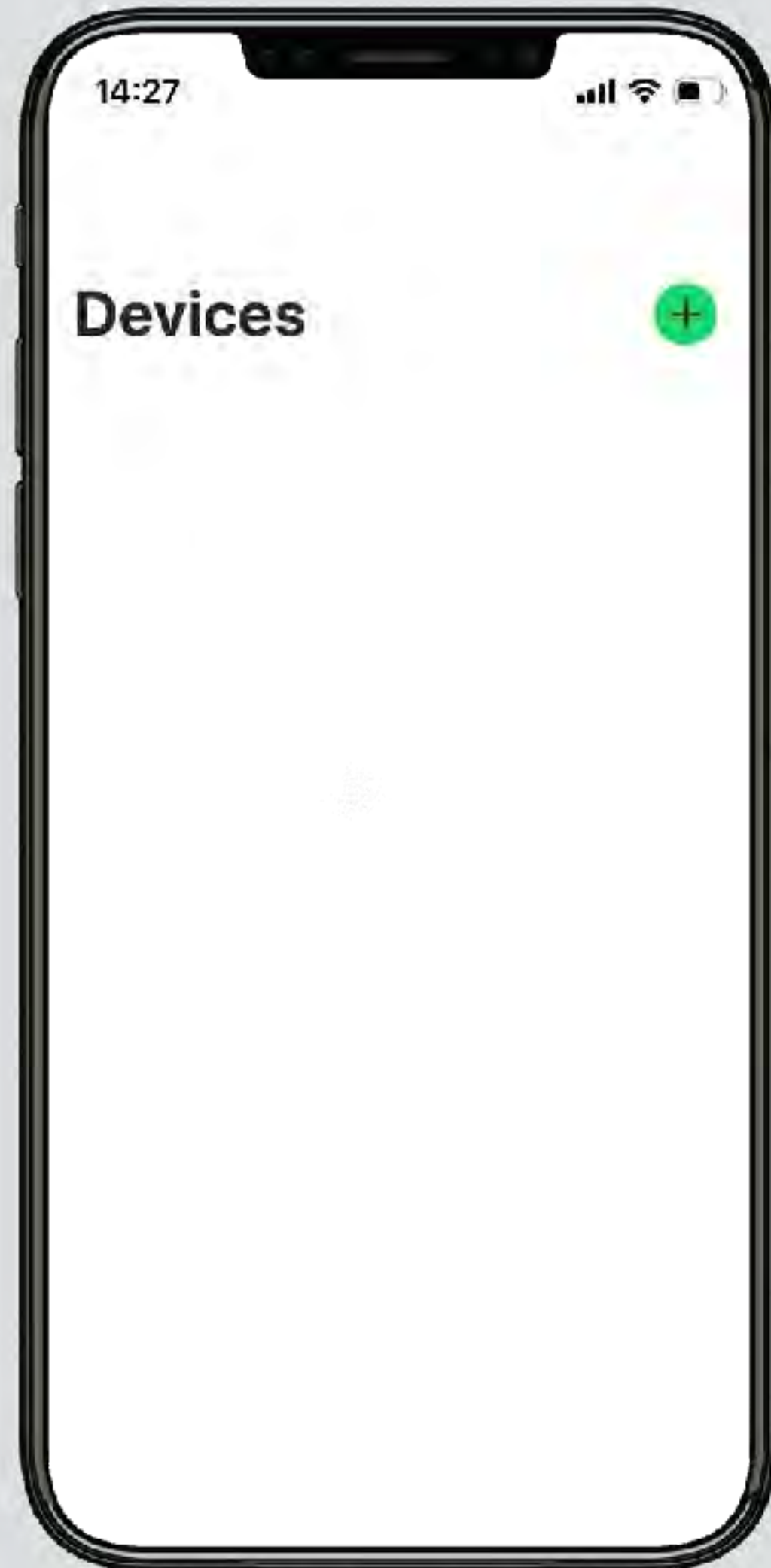
1. Bitcoin and Energy 

2. Tech, Hardware, Software 

**3. Outlook, what we're working on**

# Central heating





# Next Steps

- ✓✓ Seamless temperature control in °celsius not watts
- ✓✓ API Integration of Coinfinity
- ✓✓ API integration of variable electricity tariff APIs
- ✓✓ API integration of inverter & smartmeter APIs for PV
- ✓✓ ...

1. Bitcoin Energy 

2. Technology, Software 

3. Outlook that we're working on 

**4. Questions**

**Thank  
you!**

# Bitcoin explained simply



# 21energy

Thank you.

[www.21energy.com](http://www.21energy.com)

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