Financial investment simulation report

Emajõe Energia

Narva mnt 20, 51009 Tartu linn, Tartu maakond

2.9.2026

The electricity market is complicated, has many uncertainties and provides many revenue sources, which one must consider when making an investment decision.

The calculations are done based on production and consumption hourly data (one of them or both), available historical data about day-ahead and frequency market and will not be identical in future.

Input parameters

General

Project name:	**Emajõe Energia**
Address:	**Narva mnt 20, 51009 Tartu linn, Tartu maakond**
Description:	**Solar PV and BESS for a home**
Project lifetime:	**10 years**

Solar Park

Investment:	**7500 €**
Max production:	**7.57 kWp DC**
Inverter power:	**5.5 kW**
Inverter lifespan:	**10 years**
Yearly degradation:	**0.5 %**
Hybrid inverter:	**No**
Negative price protection:	**Yes**

Battery

Investment:	**7800 €**
Capacity:	**20 kWh**
C-rate:	**50 %**
Efficiency:	**90 %**
Cycles:	**8000**
Daily cycles limit:	**1.5**
Charge range:	**10% - 80%**
Inverter power:	**15 kW**
Yearly degradation:	**3 %**

Market

Energy contract monthly fee:	**2 €/month**
Energy contract type:	**Market**
Energy buying margin:	**0.005 €/kWh**
Energy sale margin:	**0.01 €/kWh**
Renewable energy subsidy:	**No**
Price inflation:	**3 %**
Can buy energy:	**Yes**
Can sell energy:	**Yes**

Grid connection

Grid connection amperage:	**25 A**
Grid connection import capacity:	**22 kW**
Grid connection export capacity:	**15 kW**
Grid cotract:	**Võrk 5**

Frequency Market

Can participate in aFRR?:	**Yes**
Can participate in mFRR?:	**Yes**
aFRR vs mFRR participation rate:	**50 %**
Aggregation fee:	**15 %**
Participation rate:	**50 %**

Expenses

Other CAPEX:	**0 €**
OPEX maintenance:	**0 €/year**
OPEX administrative:	**0 €/year**
OPEX insurance:	**0 €/year**
OPEX EMS:	**0 €/year**
OPEX inflation:	**0 %**

Financial

Loan duration:	**0 years**
Loan interest rate:	**0 %**
Loan share:	**0 %**
Equity interest:	**0 %**
Rate of subsidy:	**0 %**

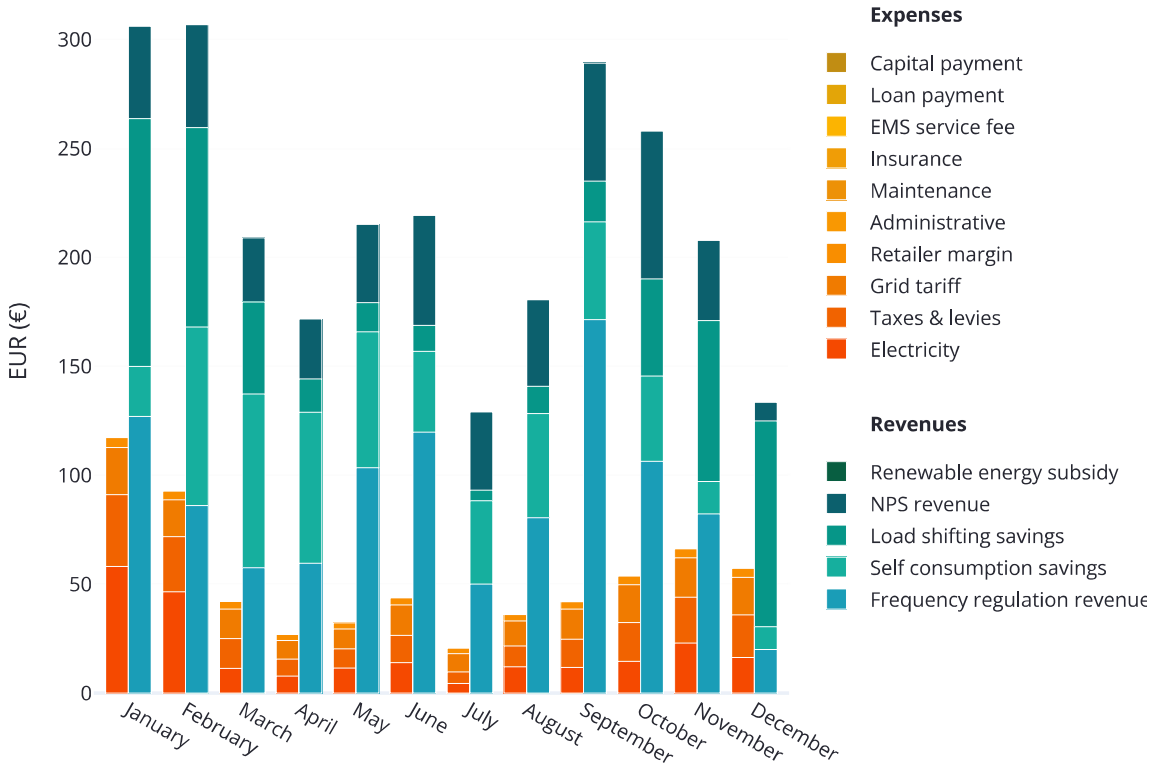
Summary

September 02, 2026

Own investments	Total first year savings	Cumulative net cash flow	Total payback period
15 300 €	1 995 €	4 721 €	8 years

Total investments	Annual loan payment	Total loan payment	Own investments payback period
15 300 €	**0 €**	**0 €**	**8 years**
Loan principal	Capital annual payment	Capital lifetime payment	IRR
0 €	**0 €**	**0 €**	**5.22 %**
PV CAPEX	Annual average interest payment	Total PV revenue	Total income
7 500 €	**0 €**	**7 160 €**	**27 258 €**
Battery CAPEX	First year PV revenue	Total battery revenue	Total expenses
7 800 €	**640 €**	**9 277 €**	**7 237 €**
Other investment costs	First year battery revenue	Total expenses	Lifetime PV capture price
0 €	**922 €**	**7 237 €**	**0.1159 € / kWh**
	First year frequency regulation revenue		Lifetime PV capture rate
	1 064 €		**140.0 %**
	First year expenses		
	631 €		

System performance & cash flow



Expense	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Administrative	0	0	0	0	0	0	0	0	0	0	0	0
Maintenance	0	0	0	0	0	0	0	0	0	0	0	0
Insurance	0	0	0	0	0	0	0	0	0	0	0	0
EMS service fee	0	0	0	0	0	0	0	0	0	0	0	0
Electricity	58	47	11	8	12	14	5	12	12	15	23	16
Retailer margin	5	4	3	3	3	3	3	3	3	4	4	4
Grid tariff	22	17	14	9	9	14	8	11	14	17	18	17
Taxes & levies	33	25	14	8	9	12	5	10	13	18	21	20
Loan payment	0	0	0	0	0	0	0	0	0	0	0	0
Capital payment	0	0	0	0	0	0	0	0	0	0	0	0
Total	117	93	42	27	32	44	21	36	42	54	66	57

Revenue	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
NPS revenue	42	47	29	28	36	50	36	40	54	68	37	9
Frequency regulation revenue	127	86	58	60	103	120	50	81	171	106	82	20
Self consumption savings	23	82	80	69	62	37	38	48	45	39	15	10
Load shifting savings	114	92	42	15	13	12	5	13	19	45	74	94
Renewable energy subsidy	0	0	0	0	0	0	0	0	0	0	0	0
Total	306	307	209	172	215	219	129	181	289	258	208	134

Monthly cost comparison

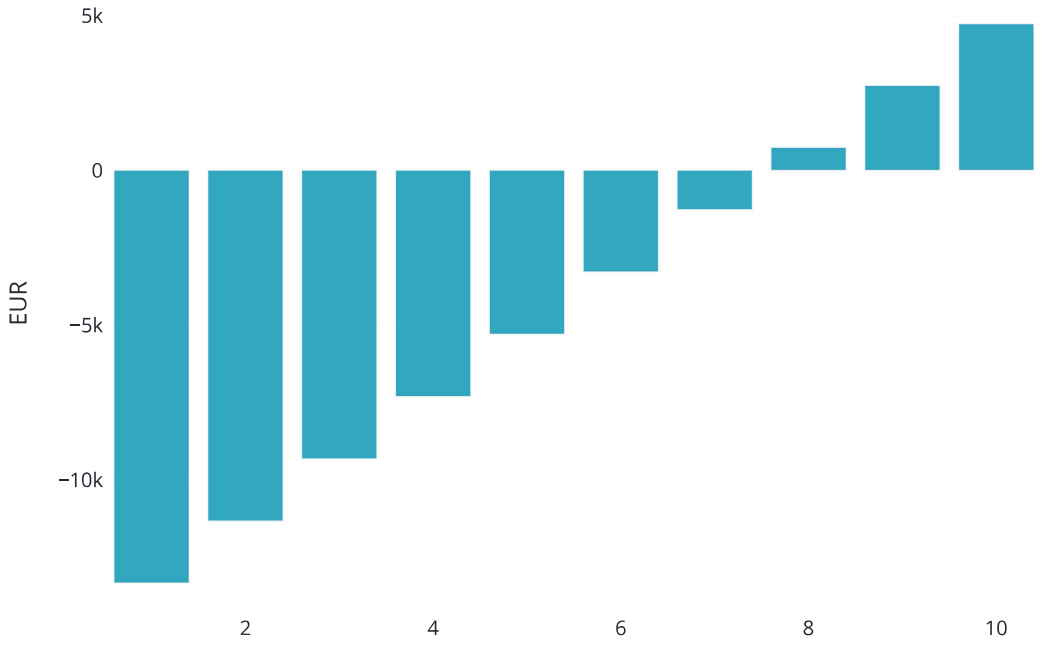


Net utility impact	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Market revenue	169	133	87	87	139	170	86	120	226	174	119	29
Expenses	117	93	42	27	32	44	21	36	42	54	66	57
Residual consumption cost	295	211	109	68	59	44	26	32	57	94	170	186
Optimized cost	243	170	64	7	-48	-83	-39	-52	-126	-26	118	215
Initial cost	432	384	231	152	135	93	69	92	121	178	259	291
Project profit	189	214	167	145	183	176	108	144	247	204	142	76

Financing overview

PV CAPEX	Equity capital	Loan capital
7 500 €	15 300 €	0 €
Battery CAPEX	**Equity interest**	**Loan interest**
7 800 €	**0.0 %**	**0.0 %**
Other investment costs	**Equity share of investments**	**Loan share of investments**
0 €	**100.0 %**	**0.0 %**
Total investments		**Loan period**
15 300 €		**0 years**

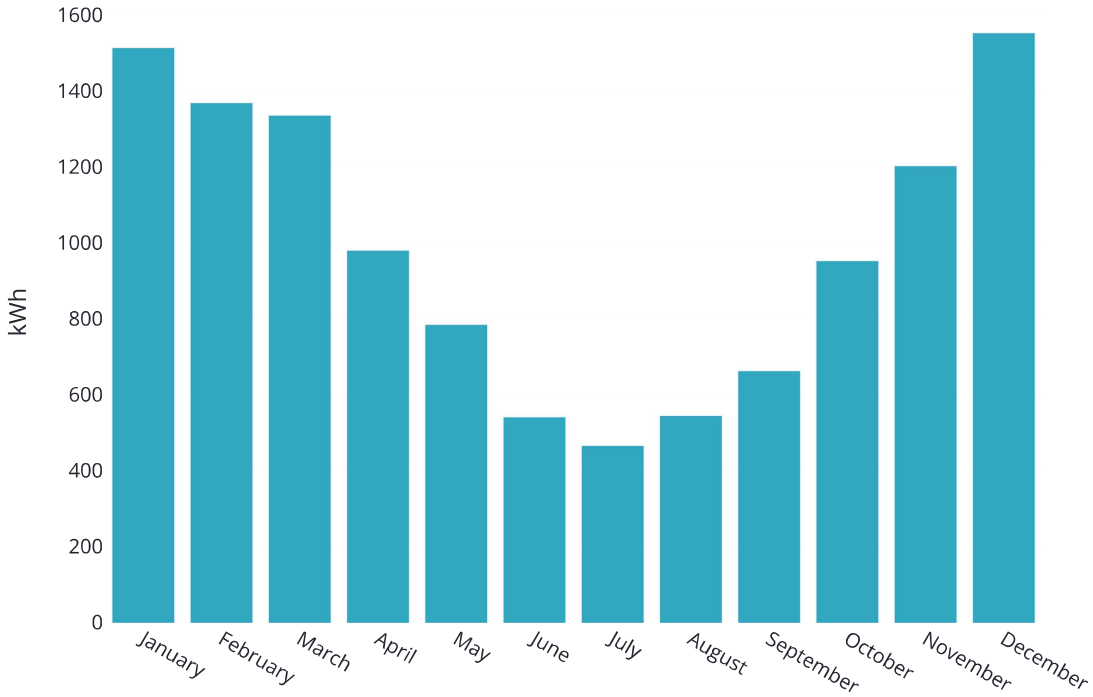
Cumulative cashflow



Consumption overview

Total annual consumption	Initial electricity cost	Initial transmission cost	Total initial consumption cost
11 909 kWh	1 062 €	1 294 €	2 356 €

Monthly consumption



Frequency regulation overview

First year frequency regulation revenue	aFRR revenue	mFRR revenue
1 064 €	51 €	1 013 €
Total revenue standard deviation	aFRR revenue standard deviation	mFRR revenue standard deviation
53 €	**15 €**	**51 €**
First year battery total downward regulation revenue	First year battery aFRR downward revenue	First year battery mFRR downward revenue
138 €	**18 €**	**119 €**
First year battery total upward regulation revenue	First year battery aFRR upward revenue	First year battery mFRR upward revenue
665 €	**18 €**	**647 €**
First year PV total upward regulation revenue	First year PV aFRR upward revenue	First year PV mFRR upward revenue
262 €	**15 €**	**247 €**
First year battery total downward regulation volume	Battery aFRR downward volume	Battery mFRR downward volume
1 859 kWh	**332 kWh**	**1 527 kWh**
First year battery total upward regulation volume	Battery aFRR upward volume	Battery mFRR upward volume
2 084 kWh	**68 kWh**	**2 016 kWh**
First year PV total upward regulation volume	PV aFRR upward volume	PV mFRR upward volume
1 702 kWh	**288 kWh**	**1 414 kWh**

PV overview

PV maximum power

5.5 kWDC

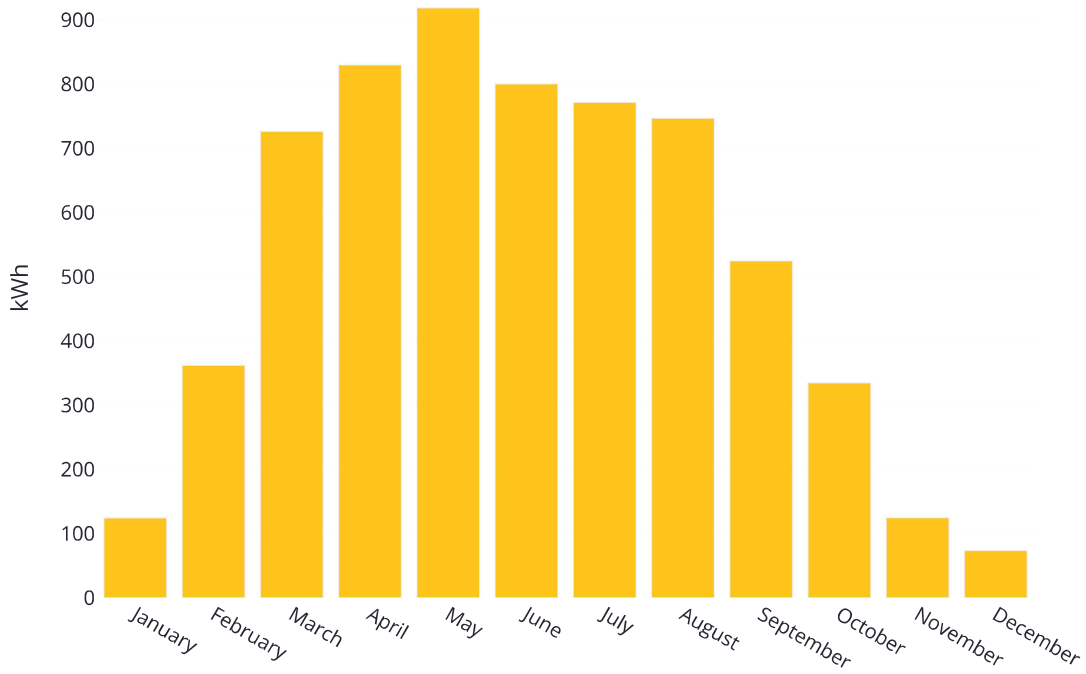
PV inverter lifespan

10 Years

Total annual PV production

6 330 kWh

Monthly PV production



Battery overview

Nominal capacity

20 kWh

Cycles done

409

Energy stored in battery

5.72 MWh

Inverter power

15.0 kW

Cycles lifetime

8000

Battery warranty

48.67 MWh

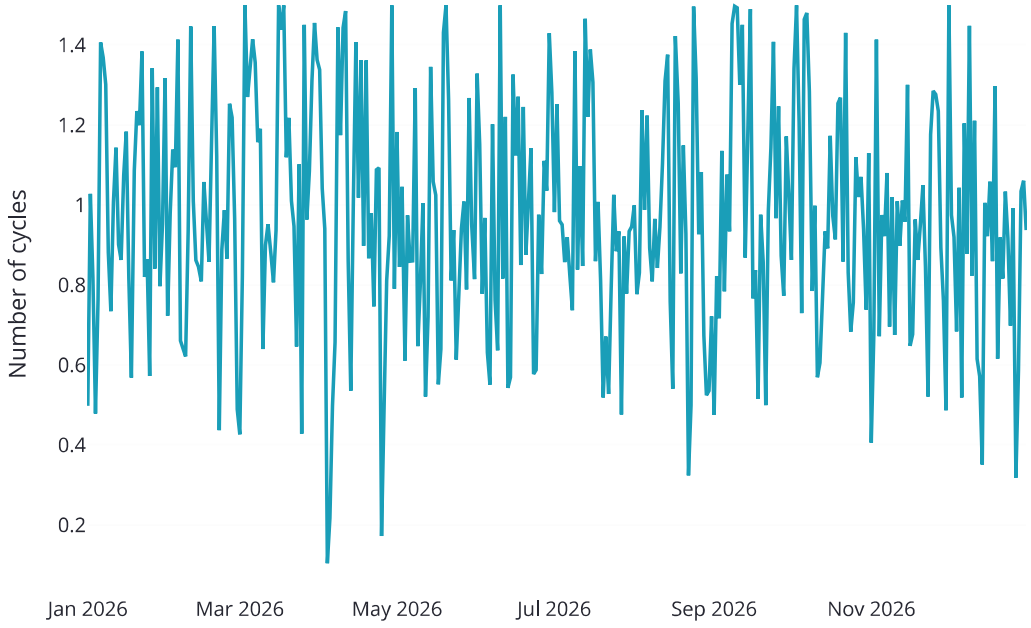
Yearly degradation

3.0 %

Battery efficiency loss

0.57 MWh

Daily number of cycles



CO2 overview

Total green energy consumed

3 031 kWh

Green energy consumption ratio

25.45 %

Initial CO2 footprint

6.05 tonnes

Green energy consumed directly from PV

2 124 kWh

Optimized CO2 footprint

5.01 tonnes

Green energy consumed via battery

907 kWh

Green energy consumption ratio

