SOLAR TECHNICAL AND FINANCIAL REPORT

SELF-CONSUMPTION + AUTONOMY
POWER **24 kWh**
FINANCING **LOAN**

CLIENT NAME	JANGAL PARIS
PROJECT LOCATION	5 AVENUE DE L'OPÉRA, PARIS, FRANCE
SOLAR FILE	SIMULATION PARIS
SIMULATION	AUTONOMY + SELF-CONSUMPTION + GRID V8640
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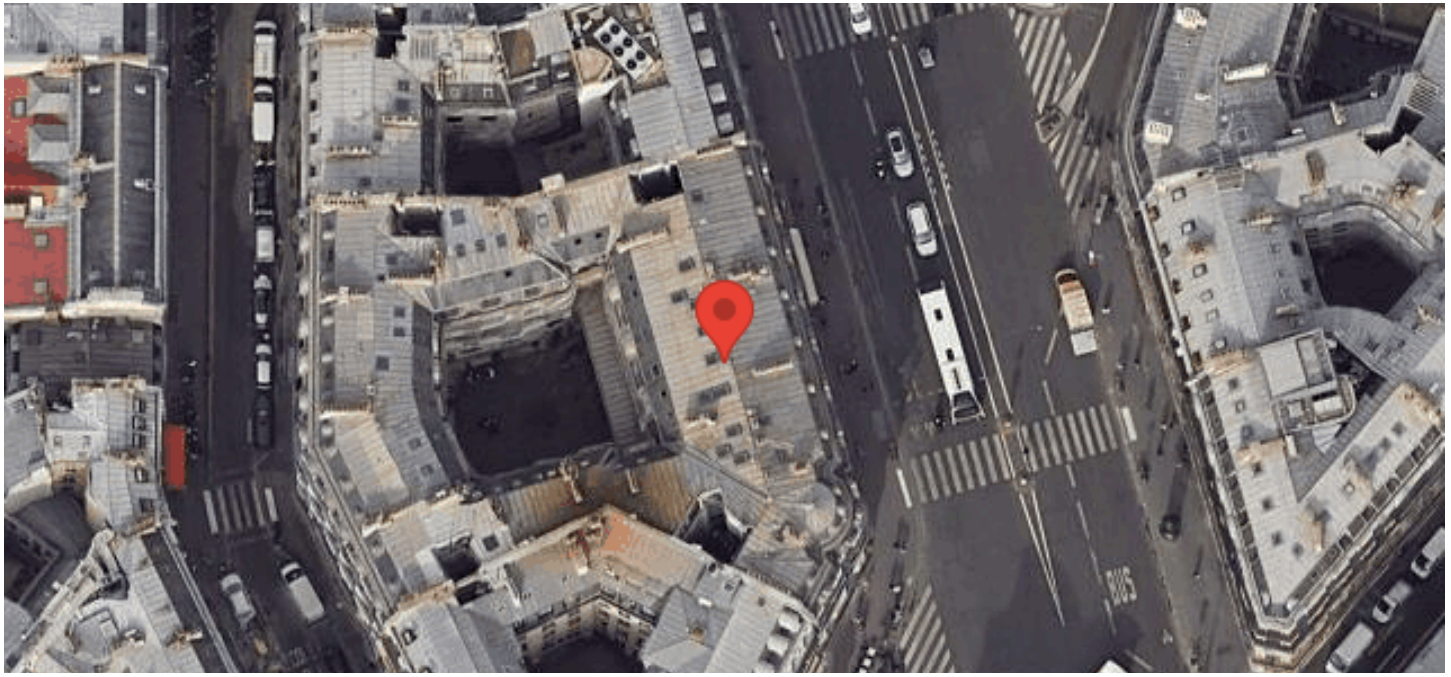
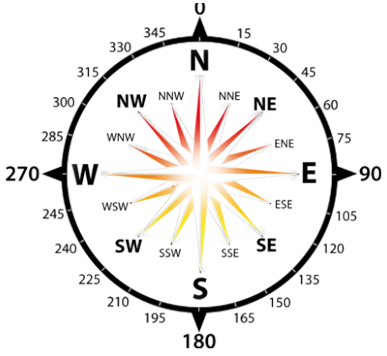
Geolocation

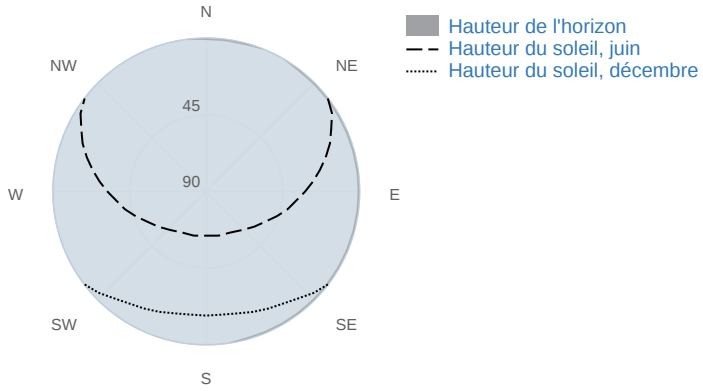
of the photovoltaic system



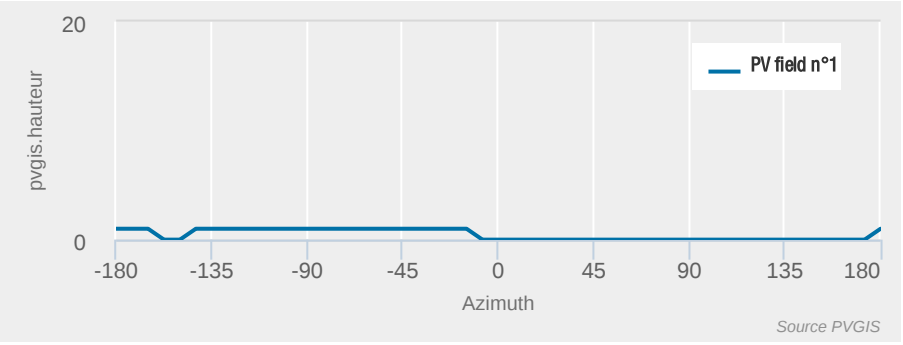
Installed PV : **12.0 KWp**
Country : **France**
City : **Paris**
Address: **Avenue de l'Opéra -5**
Latitude : **48.864809962**
Longitude: **2.3345111288**
Horizon: **Calculated** (default PVGIS24)



PVGIS Information



Solar radiation and photovoltaic production will vary if there are local hills or mountains that block sunlight at certain times of the day. PVGIS can calculate their effect using ground elevation data with a resolution of 3 arc-seconds (about 90 meters). This calculation does not consider shadows from very nearby objects like houses or trees.



On this graph, we can read the height of the relief while around the photovoltaic installation, it is the distant mask, which can cause shading on installation.
These shadings are taken into account in the estimate of annual photovoltaic production.

- Database used : **PVGIS-SARAH3**
- Estimated additional loss of production due à l'angle d'incidence aux effets spectraux : **11.43%**

Photovoltaic System Information

- Photovoltaic technology : **Crystalline silicon**
- Mounting system : **Overlay**

Installed PV :	**12.0 kWp**
Cable loss :	**1%**
Inverter loss :	**2%**
Annual PV loss :	**0.5%**
Slope angle :	**0°**
Azimuth angle :	**180° (N)**

The estimated system losses encompass all losses within the system, which means the actual energy supplied to the power grid is less than the energy produced by the photovoltaic modules. Several factors contribute to these losses, including cable losses, inverters, dirt (sometimes snow) on the modules, etc. Over the years, the modules also tend to lose some of their power, so the average annual production over the system's lifetime will be a few percentage points lower than the production of the initial years.

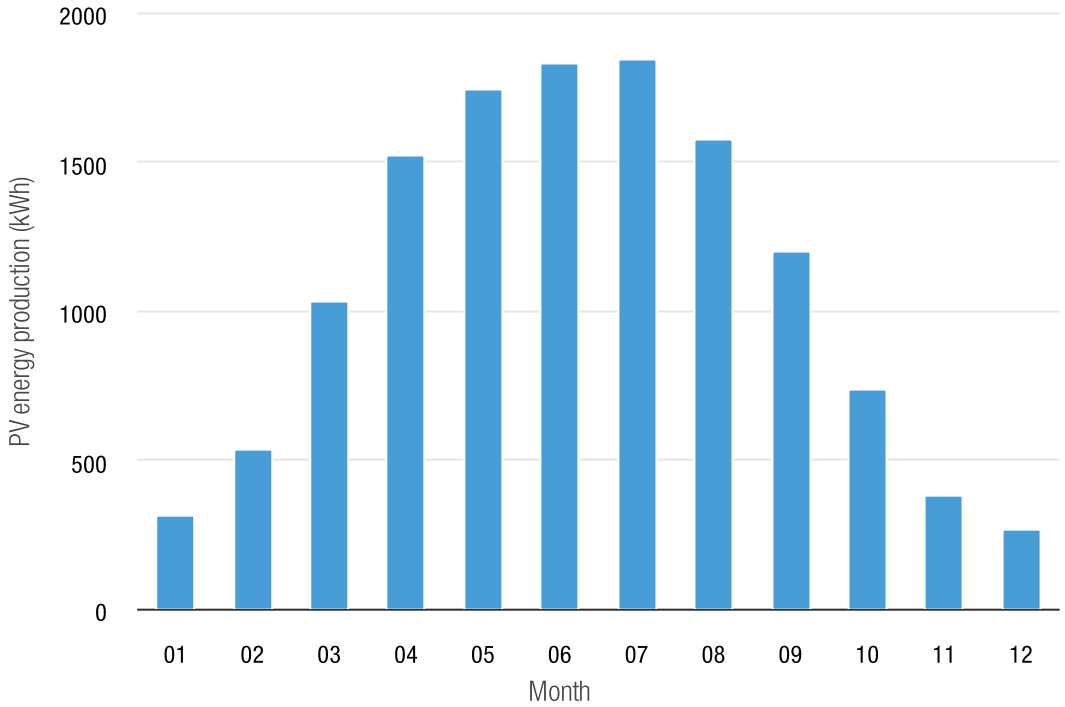
PVGIS 5.3 provides a default value of 14% for the total losses in the solar electricity generation system.

PVGIS24 Simulator proposes a loss value for the first year of operation. This loss will evolve year by year. This first-year loss value allows for a more detailed technical and financial analysis, year by year. Thus, over a 20-year operational period, the total production loss is close to 13% to 14%.

PVGIS Photovoltaic Production

Annual photovoltaic energy production : **12,954.00 kWh**

Variability from year to year: **4.21%** (544.80kWh)

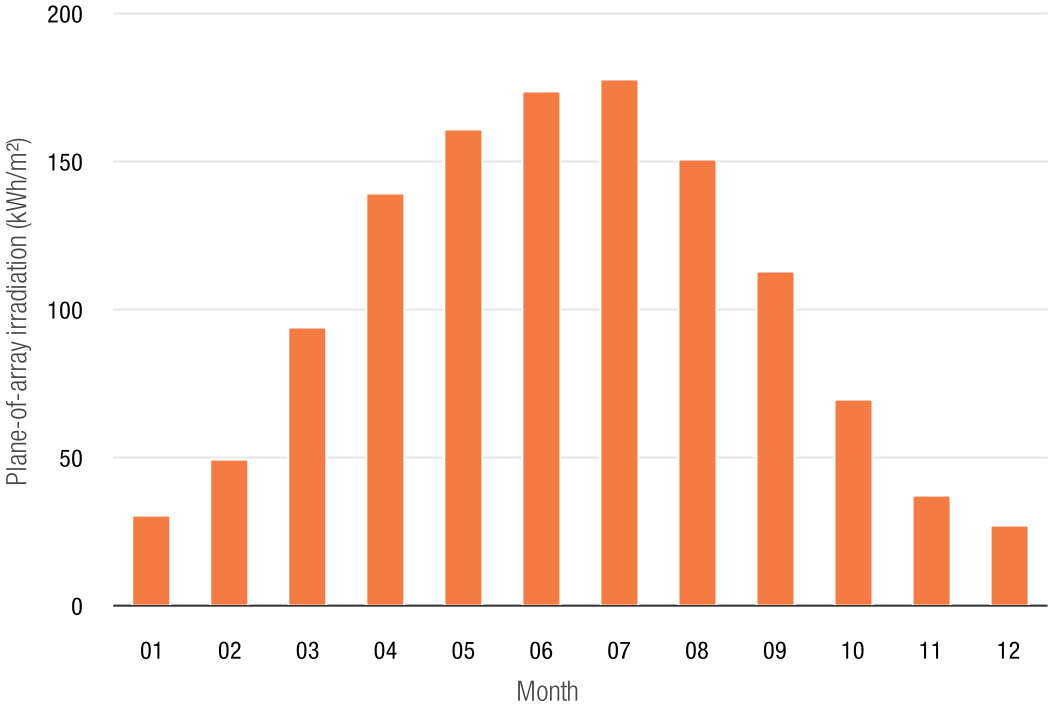


Month	kWh	%
01 - January	310,56	2.40%
02 - February	533,76	4.12%
03 - March	1 029,36	7.95%
04 - April	1 517,52	11.71%
05 - May	1 739,76	13.43%
06 - June	1 829,16	14.12%
07 - July	1 845,48	14.25%
08 - August	1 577,04	12.17%
09 - September	1 196,16	9.23%
10 - October	734,04	5.67%
11 - November	378,72	2.92%
12 - December	262,20	2.02%

The result of the photovoltaic energy calculation: is the average monthly energy production and the average annual production of the photovoltaic installation with the chosen properties. The inter-annual variability is the standard deviation of the annual values calculated over the period covered by the selected solar radiation database.

Monthly irradiation on a fixed plane

Annual irradiation	1,218.83 kWh/m²

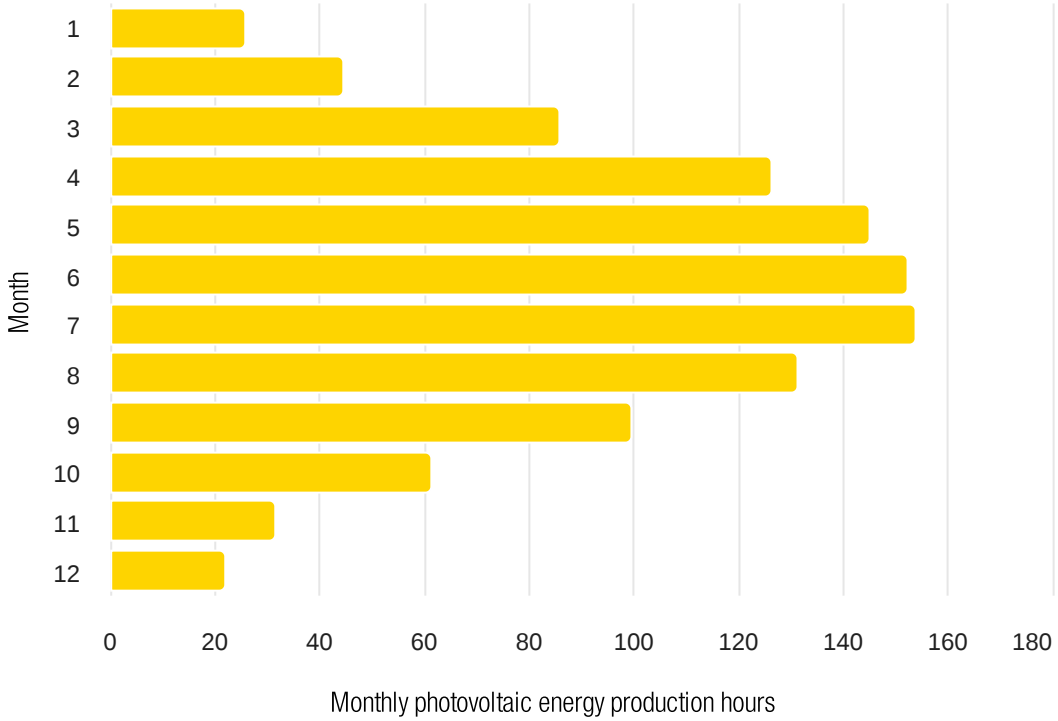


Month	kWh/m²	%
01 - January	30,31	2.49%
02 - February	49,31	4.05%
03 - March	93,31	7.66%
04 - April	139,03	11.41%
05 - May	160,76	13.19%
06 - June	173,06	14.20%
07 - July	177,10	14.53%
08 - August	150,46	12.34%
09 - September	112,76	9.25%
10 - October	69,09	5.67%
11 - November	36,79	3.02%
12 - December	26,85	2.20%

Monthly solar irradiation Is determined for each hour of the day for a selected month, with the average being calculated over all days of that month during the multi-year period for which PVGIS has data. In addition to calculating the average solar radiation, the daily application of radiation also computes the daily variation of clear-sky radiation.

Monthly Production Hours photovoltaic energy

Annual photovoltaic energy production hours : **1,079.50 hours** (average 3.0 hours per day)



Month	Hours/Month	Hours/Day
01 - January	25.9	0.9
02 - February	44.5	1.6
03 - March	85.8	2.8
04 - April	126.5	4.3
05 - May	145.0	4.7
06 - June	152.5	5.1
07 - July	153.8	5.0
08 - August	131.5	4.3
09 - September	99.7	3.4
10 - October	61.2	2.0
11 - November	31.6	1.1
12 - December	21.9	0.7

The hours of monthly photovoltaic energy production represent the total time over a month that a solar installation produces of electricity, influenced by sunlight, system efficiency and operating conditions. It is a key indicator for evaluating performance and energy self-sufficiency.

Consumption Analysis

Year : 2025

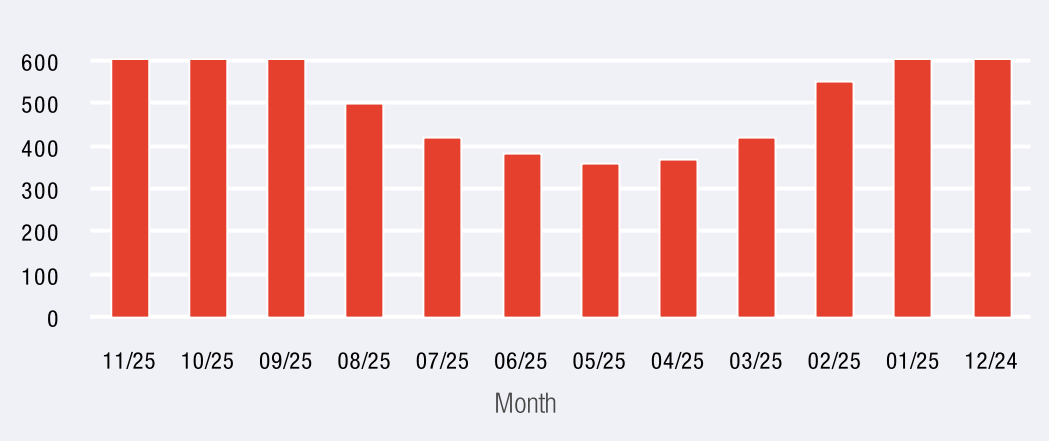
Total period : **6,470 kWh / 1,618 €**

Average day of the period : **18 kWh / 5 €**

Monthly average for the period : **540 kWh / 135 €**

Purchase price : **0.25 €**

Months	11	10	09	08	07	06	05	04	03	02	01	12
€	188	170	155	125	105	95	90	93	105	138	170	185
kWh / Months	750	680	620	500	420	380	360	370	420	550	680	740
kWh / Days	25	21	20	16	13	12	11	12	13	19	21	23
% Average	11.6 %	10.5 %	9.6 %	7.7 %	6.5 %	5.9 %	5.6 %	5.7 %	6.5 %	8.5 %	10.5 %	11.4 %



This analysis uses a method designed to evaluate energy consumption and its cost over a defined period, segmenting the data into monthly and daily averages.

- **Basic data :** The total annual energy consumption (kWh) is distributed by month to examine the variability of demand; the associated cost is determined based on a unit purchase rate.
- **Temporal breakdown :** Monthly and daily averages provide a detailed understanding of consumption fluctuations throughout the year; an average percentage reflects each month's relative contribution to the annual total.
- **Purpose :** This method helps identify periods of high or low consumption and plan strategies for energy optimization or cost management.

Provide a clear and actionable overview of energy consumption to improve the sizing of solar installations or storage systems while keeping energy costs under control.

Self-consumption analysis

Theoretical calculation of the financial economy per year

ANNUAL kWh consumption	100%	**6,470 kWh**
Average Consumption KWh WEEK	60%	**3,882 kWh**
Average Consumption KWh WE	40%	**2,588 kWh**

Total Annual kWh Consumption Day (7 a.m. - 5 p.m.) 2,316 kWh / 36% annual day consumption

	Week		Weekend	
Number of kWh DAY (7 a.m.-5 p.m.)	33%	**1,281 kWh**	40%	**1,035 kWh**
Number of kWh EVENING (5 p.m.-11 p.m.)	59%	**2,290 kWh**	54%	**1,398 kWh**
Number of kWh NIGHT (11 p.m.-7 a.m.)	8%	**311 kWh**	6%	**155 kWh**

Self-consumption potential per year 660 kWh *(6,470 kWh x 10.20%)*

Annual yield PVGIS	**12,954 kWh**	
Average productive hours per day	**2.96 h**	
% Average production hours per day	**29.58%**	*(2.96 h / 10 h)*
% Self-consumption potential per year	**10.20%**	*(29.58% x 36%)*

FINANCIAL ECONOMY SELF-CONSUMPTION PER YEAR **165 €** *(660 kWh x 0.25 €)*

This analysis is based on a theoretical approach aimed at estimating the financial savings associated with solar energy self-consumption, relying on annual consumption and photovoltaic production data.

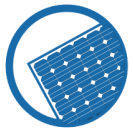
Energy consumption breakdown : The total consumption is segmented by time periods (weekdays, weekends, daytime, evening, nighttime) to assess the specific energy needs for each time slot. This approach helps identify daytime consumption, which reflects the potential for self-consumption.

Estimation of self-consumption potential: The solar production estimated by PVGIS is compared with daytime consumption. The coverage percentage indicates the portion of daytime consumption that can be directly supplied by solar energy.

Calculation of financial savings: Self-consumed kWh are valued based on the energy purchase tariff to calculate annual savings.

This analysis provides a quantitative basis for evaluating the financial benefits of self-consumption and optimizing the size of solar installations. This method also helps identify key periods to maximize the use of the energy produced.

Key figures



PHOTOVOLTAIC SYSTEM

Power : 12.0 kWp

Production year 1 : **12,954 kWh**
Annual drop in production : **0.5 %**
Grid Resale Price : **€ 0.2**
Revenue Resale year 1 : **€ 2,202**
Annual Increase in Feed-in Tariff : **2.0 %**

INVESTMENT

System Cost : € 27,000

Photovoltaic System Price :**€ 36,000**
Subsidy : **€ 5,400 / 15 %**
Bonuses : **€ 3,600 / 10 %**
Cost per Watt : **€ 2**

CONSUMPTION

Consumption Year 1 : 6,470 kWh

Annual increase in consumption : **1.0%**
Network Purchase Rate : **€ 0.3**
Network Purchase Invoice year 1 : **€ 1,618**
Annual increase in the Purchase Rate : **3.5%**

FINANCING

Loan : € 36,000

Monthly Payment : **€ 596**
Initial Deposit : **€ 4,600 / 10 %**
Duration : **5 years**
Interest Rate : **5 %**

Performance Indices

Savings 34 years: € 98,459

Cash flow differential:
Year € 5,192 / Months € 433 / Day € 14

Self-consumption rate : 10%

Autonomy Rate : 90%

Internal rate of return (IRR) : 11%

& Return on Investment - ROI : 9 years

The IRR (Internal Rate of Return) is the internal profitability rate of an investment for a series of negative and positive cash flows.

Grid Bill / Depreciation of purchasing power

	Grid Pricing	kWh	Grid invoices
	3.50 %	1 %	1 259 467 €
Y1	0.25 €	6,470	1,617.50 €
Y2	0.26 €	6,535	1,690.85 €
Y3	0.27 €	6,600	1,767.53 €
Y4	0.28 €	6,666	1,847.69 €
Y5	0.29 €	6,733	1,931.48 €
Y6	0.30 €	6,800	2,019.08 €
Y7	0.31 €	6,868	2,110.64 €
Y8	0.32 €	6,937	2,206.36 €
Y9	0.33 €	7,006	2,306.42 €
Y10	0.34 €	7,076	2,411.01 €
Y11	0.35 €	7,147	2,520.35 €
Y12	0.36 €	7,218	2,634.65 €
Y13	0.38 €	7,291	2,754.13 €
Y14	0.39 €	7,363	2,879.03 €
Y15	0.40 €	7,437	3,009.60 €
Y16	0.42 €	7,511	3,146.08 €
Y17	0.43 €	7,587	3,288.76 €
Y18	0.45 €	7,662	3,437.90 €
Y19	0.46 €	7,739	3,593.81 €
Y20	0.48 €	7,816	3,756.79 €
Y21	0.50 €	7,895	3,927.16 €
Y22	0.51 €	7,974	4,105.26 €

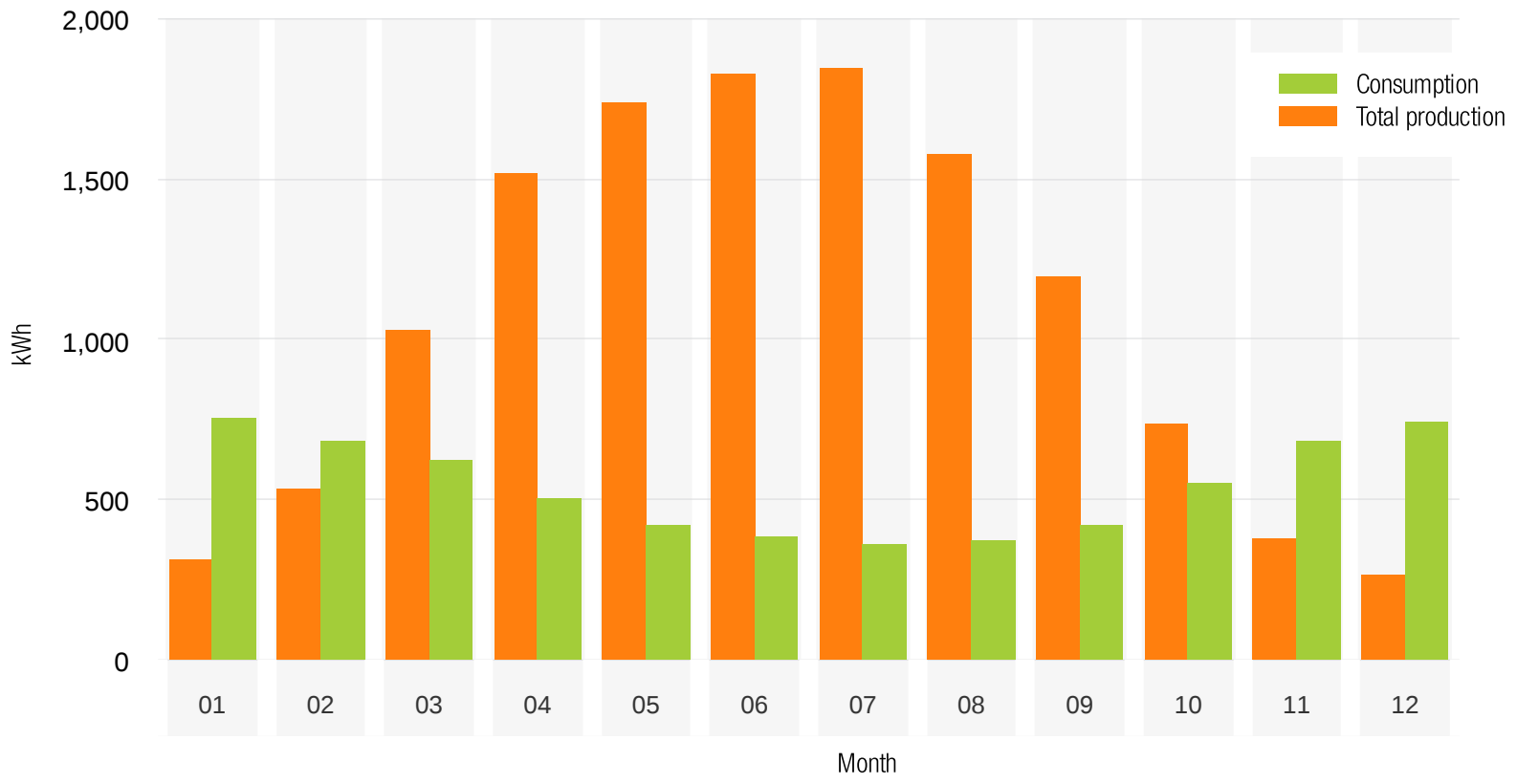
Deterioration of purchasing power		
Year	Inflation	Depreciation
Y1	27,000 €	
Y2	24,300 €	10%
Y3	21,870 €	19%
Y4	19,683 €	27%
Y5	17,715 €	34%
Y6	15,943 €	41%
Y7	14,349 €	47%
Y8	12,914 €	52%
Y9	11,623 €	57%
Y10	10,460 €	61%
Y11	9,414 €	65%
Y12	8,473 €	69%
Y13	7,626 €	72%
Y14	6,863 €	75%
Y15	6,177 €	77%
Y16	5,559 €	79%
Y17	5,003 €	81%
Y18	4,503 €	83%
Y19	4,053 €	85%
Y20	3,647 €	86%
Y21	3,283 €	88%
Y22	2,954 €	89%

Grid Bill / Depreciation of purchasing power

	Grid Pricing	kWh	Grid invoices
	3.50 %	1 %	1 259 467 €
Y23	0.53 €	8,053	4,291.43 €
Y24	0.55 €	8,134	4,486.05 €
Y25	0.57 €	8,215	4,689.49 €
Y26	0.59 €	8,297	4,902.16 €
Y27	0.61 €	8,380	5,124.47 €
Y28	0.63 €	8,464	5,356.87 €
Y29	0.66 €	8,549	5,599.80 €
Y30	0.68 €	8,634	5,853.75 €
Y31	0.70 €	8,721	6,119.22 €
Y32	0.73 €	8,808	6,396.73 €
Y33	0.75 €	8,896	6,686.82 €
Y34	0.78 €	8,985	6,990.06 €

Deterioration of purchasing power		
Year	Inflation	Depreciation
Y23	2,659 €	90%
Y24	2,393 €	91%
Y25	2,154 €	92%
Y26	1,938 €	93%
Y27	1,744 €	94%
Y28	1,570 €	94%
Y29	1,413 €	95%
Y30	1,272 €	95%
Y31	1,145 €	96%
Y32	1,030 €	96%
Y33	927 €	97%
Y34	834 €	97%

Production and Consumption



A histogram comparing solar production and energy consumption offers several advantages for analysis and decision-making, especially in the context of energy optimization.

Autonomy Hypothesis

Year : 2025

Production Site

Total period months : **6470 kWh**

Total Self-Consumption : **540 kwh**

Total Autonomy : **5810 kWh**

Months	01	02	03	04	05	06	07	08	09	10	11	12
kWh / Month	750	680	620	500	420	380	360	370	420	550	680	740
kWh / Day	188	170	155	125	105	95	90	93	105	138	170	185
kWh Self-consumption	54	56	54	56	56	54	56	54	56	51	56	56
kWh Autonomy	23.2	20.1	18.9	14.3	11.7	10.9	9.8	10.5	11.7	17.8	20.1	22.1

This analysis illustrates the hypothesis of energy autonomy for a production site, based on total consumption, self-consumption, and the autonomy provided by the system.

Energy Consumption Estimation: The monthly and daily consumption is calculated to understand the energy needs of the site over a given period.

Self-Consumption Calculation : Locally produced and directly consumed energy (self-consumption) is estimated to assess the share of production used without relying on the grid.

Energy Autonomy: The potential for autonomy (produced and consumed energy on-site) is calculated in kWh for each month, reflecting the system's ability to reduce grid dependency.

This approach helps measure the level of energy autonomy achieved by the photovoltaic system while identifying the months where self-consumption and autonomy are optimized, thereby enabling decisions to improve overall performance.

Autonomy Hypothesis

Year : 2025

Battery Hypothesis

Total kWh/year Batteries 24 kWh : **8760 kWh**

Total kWh/year Batteries 15 kWh : **5475 kWh**

Total kWh/year Batteries 10 kWh : **3650 kWh**

Months	11	10	09	08	07	06	05	04	03	02	01	12
kWh Autonomy	23.2	20.1	18.9	14.3	11.7	10.9	9.8	10.5	11.7	17.8	20.1	22.1
Batteries 24 kWh	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %
Batteries 15 kWh	64 %	74 %	79 %	100 %	100 %	100 %	100 %	100 %	100 %	84 %	74 %	67 %
Batteries 10 kWh	43 %	49 %	53 %	69 %	85 %	92 %	100 %	95 %	85 %	56 %	49 %	45 %

This analysis relies on a method for evaluating the performance of batteries with various capacities to estimate their annual energy contribution and suitability to the needs.

Capacity and monthly availability: Battery capacities are compared with the required autonomy each month to assess their energy coverage.

Total annual consumption: The energy provided by each battery over a one-year period is calculated to measure its overall performance.

Optimal usage: Monthly percentages reveal periods when batteries exceed or reach their limits, allowing the determination of whether they are undersized or oversized.

This method aims to properly size batteries to maximize efficiency while avoiding energy waste or insufficient autonomy.

Autonomy Hypothesis

Year : 2025

Battery Consumption

Average Yearly Battery Consumption

Batteries 24 kWh : **66 %**

Batteries 15 kWh : **88 %**

Batteries 10 kWh : **100 %**

Months	11	10	09	08	07	06	05	04	03	02	01	12
kWh Autonomy	23.2	20.1	18.9	14.3	11.7	10.9	9.8	10.5	11.7	17.8	20.1	22.1
Batteries 24 kWh	97 %	84 %	79 %	60 %	49 %	45 %	41 %	44 %	49 %	74 %	84 %	92 %
Batteries 15 kWh	100 %	100 %	100 %	95 %	78 %	72 %	65 %	70 %	78 %	100 %	100 %	100 %
Batteries 10 kWh	100 %	100 %	100 %	100 %	100 %	100 %	98 %	100 %	100 %	100 %	100 %	100 %

The analysis of battery consumption based on their capacity and monthly energy needs relies on:

- **Energy coverage calculation:** We evaluate how each battery size meets the monthly needs.
- **Annual average:** Allows comparing the effectiveness of different capacities over a full year.
- **Monthly usage:** Identifies periods when the battery reaches its maximum capacity or remains underutilized. This approach helps size the batteries according to real needs, balancing autonomy and resource optimization.

Autonomy Hypothesis

Year : 2025

Grid Cost

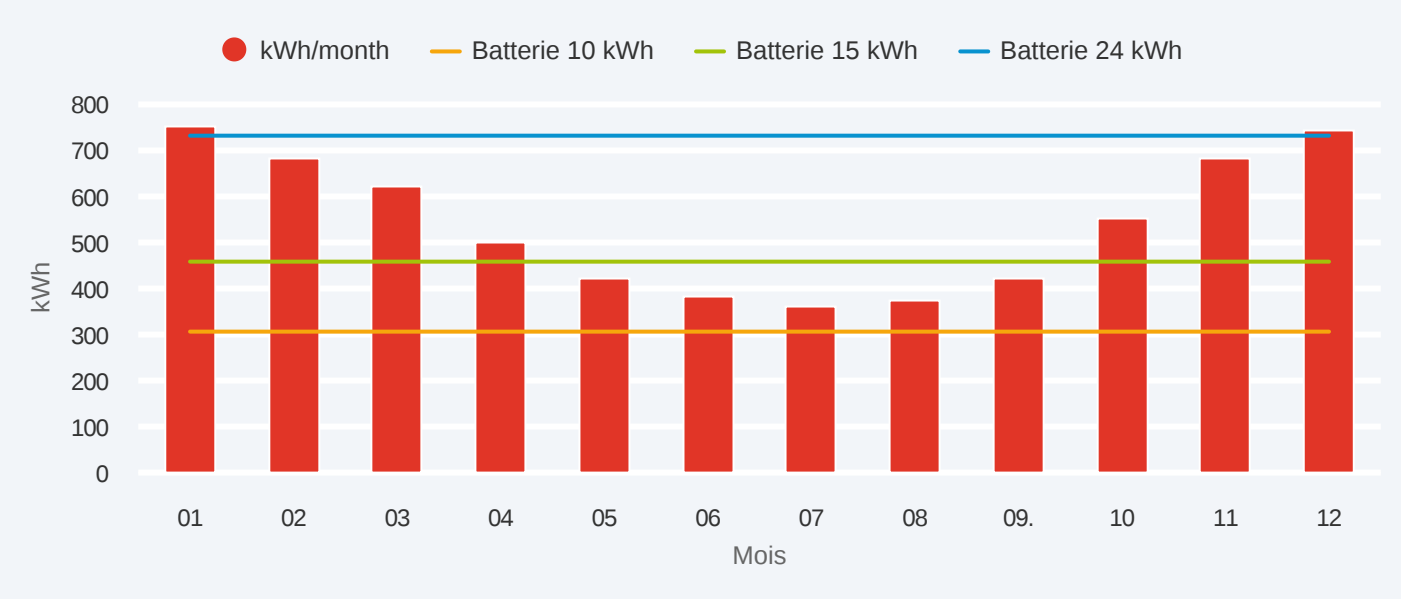
	Yearly Grid Cost	Savings
Batteries 24 kWh :	**66 %**	**1618 € 100%**
Batteries 15 kWh :	**88 %**	**1352 € 84%**
Batteries 10 kWh :	**100 %**	**1024 € 63%**

Months	11	10	09	08	07	06	05	04	03	02	01	12
kWh Autonomy	23.2	20.1	18.9	14.3	11.7	10.9	9.8	10.5	11.7	17.8	20.1	22.1
Batteries 24 kWh	0	0	0	0	0	0	0	0	0	0	0	0
Batteries 15 kWh	66	43	32	0	0	0	0	0	0	22	43	59
Batteries 10 kWh	107	86	73	38	16	8	0	5	16	60	86	101

This table compares the impact of different battery capacities on energy autonomy, grid costs, and annual savings. Batteries with higher capacity provide better savings and further reduce grid dependency but require a higher initial investment.

Autonomy Hypothesis

Year : 2025
Consumption Curve (kWh) / Total Battery Autonomy



Battery Wear	60 %	65 %	70 %	75 %	80 %	85 %	90 %	95 %	100 %
Cycles	**13,333**	**12,381**	**11,429**	**10,715**	**10,000**	**9,445**	**8,889**	**8,445**	**8,000**
Lifespan	37 years	34 years	31 years	29 years	27 years	26 years	24 years	23 years	22 years

	Batteries 10 kWh	Batteries 15 kWh	Batteries 24 kWh
Battery Wear	100%	88%	66%
Battery longevity	23 ans	26 ans	34 ans
Annual Savings	63%	84%	100%
Annual Residual Network	€ 593.10	€ 265.66	€ -
Monthly Residual	€ 49.42	€ 22.14	€ -

Comparison of Financing: Cash / Loan / Leasing

Batteries 24 kWh

System Price	**36,000 €**
Battery price	**36,000 €**
SUBSIDY AND BONUS	**5,400 €**
NET COST	**27,000 €**

Cash

Cash Deposit	**36,000 €**

Cash financing

TRI -%	PROFIT - €

Treasury	27,000 €
1st Payment 50 %	**18,000 €**
4 checks of 10 %	**3,600 €**

Loan (BANK 1)

Cash Deposit	**4,600 €**

5-Year Loan Financing / 0.17%

TRI -%	PROFIT - €

The difference between the cost of the loan and the resale proceeds is:

4,952€/years	413€/month	14€/day

Treasury	(4,400) €
Monthly loan cost	**596 €**
Annual loan cost	**7,154 €**

Loan 2 (BANK 2)

Cash Deposit	**9,200 €**	**300**€/day

10-Year Loan Financing / 0.17%

TRI -%	PROFIT - €

The difference between the cost of the loan and the resale proceeds is:

1,401€/years	117€/month	4€/day

Treasury	200 €
Monthly loan cost	**300 €**
Annual loan cost	**3,603 €**

Simplified Financial Comparison

Batteries 10 kWh	
I am partially autonomous	
Batteries	10 kWh
Solar Panels	500 kW
SAE Roof Operating Area	24 m2
Determination of SAE financial cost	
Price	15,000 €
Subsidy 25%	3,750 €
TOTAL COST	**11,250 €**
COST per Watt Hour	**1 €**
Cash Financing	
1st Payment 50 %	7,500 €
4 checks of 10 %	1,500 €
DEPOSIT	**15,000 €**
SUBSIDY	**3,750 €**
TREASURY	**11,250 €**
Battery consumption kWh per year	3,650 kWh
Grid Pricing	0 €
Guaranteed savings per year	913 €
RESIDUAL TO BE FINANCED / YEAR	**- €**
FLAT RESIDUAL TO BE FINANCED / MONTH	**- €**
FLAT RESIDUAL TO BE FINANCED / DAY	**- €**
- €/years	**- €/month** **- €/day**

Batteries 15 kWh	
I am partially autonomous	
Batteries	15 kWh
Solar Panels	500 kW
SAE Roof Operating Area	36 m2
Determination of SAE financial cost	
Price	22,500 €
Subsidy 25%	5,625 €
TOTAL COST	**16,875 €**
COST per Watt Hour	**1 €**
Cash Financing	
1st Payment 50 %	11,250 €
4 checks of 10 %	2,250 €
DEPOSIT	**22,500 €**
SUBSIDY	**5,625 €**
TREASURY	**16,875 €**
Battery consumption kWh per year	5,475 kWh
Grid Pricing	0 €
Guaranteed savings per year	1,369 €
RESIDUAL TO BE FINANCED / YEAR	**- €**
FLAT RESIDUAL TO BE FINANCED / MONTH	**- €**
FLAT RESIDUAL TO BE FINANCED / DAY	**- €**
- €/years	**- €/month** **- €/day**

Batteries 24 kWh	
I am partially autonomous	
Batteries	24 kWh
Solar Panels	500 kW
SAE Roof Operating Area	58 m2
Determination of SAE financial cost	
Price	36,000 €
Subsidy 25%	9,000 €
TOTAL COST	**27,000 €**
COST per Watt Hour	**1 €**
Loan 1 Financing	
Loan 90%	32,400 €
Cost of the loan 5/years	36,909 €
Per year / 5 years	7,382 €
DEPOSIT	**3,600 €**
SUBSIDY	**9,000 €**
TREASURY	**(5,400) €**
Battery consumption kWh per year	8,760 kWh
Grid Pricing	0 €
Guaranteed savings per year	2,190 €
RESIDUAL TO BE FINANCED / YEAR	**5,192 €**
FLAT RESIDUAL TO BE FINANCED / MONTH	**433 €**
FLAT RESIDUAL TO BE FINANCED / DAY	**14 €**
5,192 €/years	**433 €/month** **14 €/day**

Comparison of Financing: Cash / Loan / Leasing

What to remember

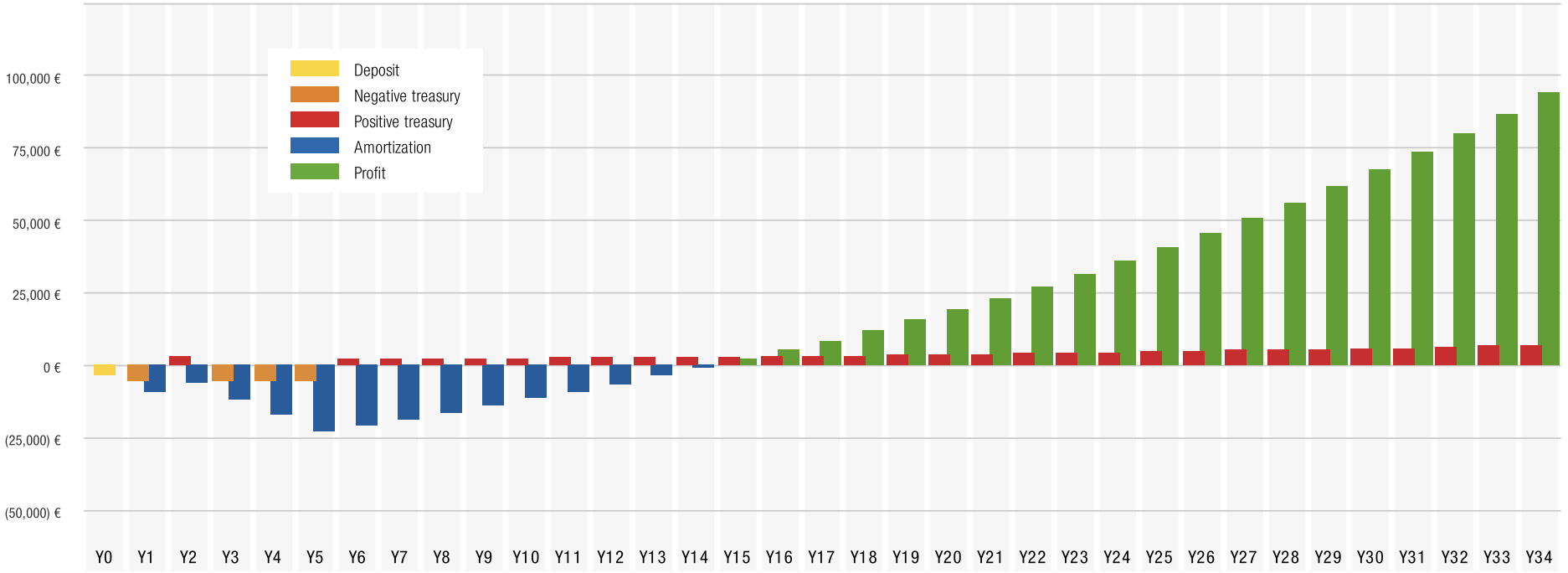
Batteries 10 kWh	
-€/day	
Net Cost Total Maintenance Included	**11,250 €**
Annual loan cost	**- €**
Guaranteed Annual Savings	**913 €**
Difference between the Loan and the Savings	**- €**
Per Day	**0 €/day**

Batteries 15 kWh	
-€/day	
Net Cost Total Maintenance Included	**16,875 €**
Annual loan cost	**- €**
Guaranteed Annual Savings	**1,369 €**
Difference between the Loan and the Savings	**- €**
Per Day	**0 €/day**

Batteries 24 kWh	
14€/day	
Net Cost Total Maintenance Included	**27,000 €**
Annual loan cost	**7,382 €**
Guaranteed Annual Savings	**2,190 €**
Difference between the Loan and the Savings	**5,192 €**
Per Day	**14 €/day**

Cash Flow Chart & Return on Investment - ROI

Batteries 24 kWh

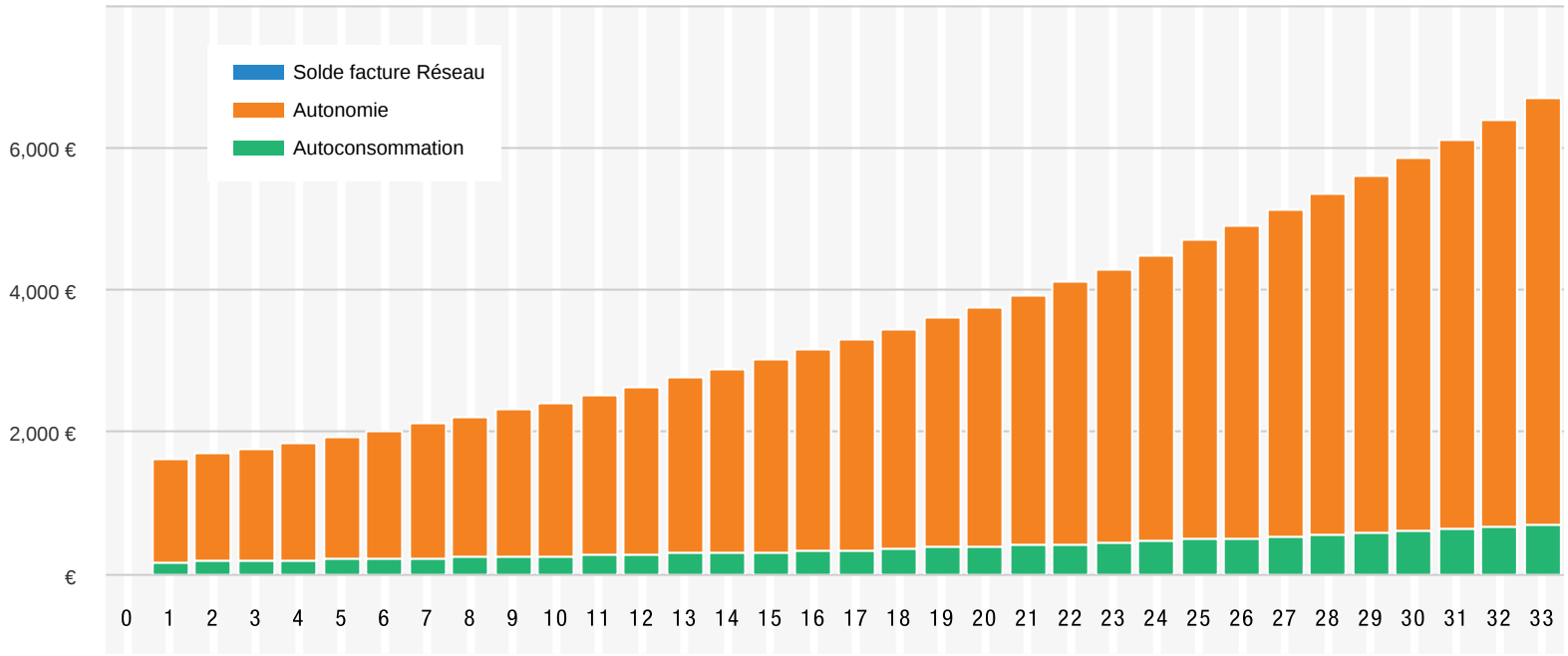


This histogram, representing cash flows and the return on investment (ROI), allows to:

- Visualize financial movements over a specified period, distinguishing between positive bars (income) and negative bars (expenses).
- Identify the point where ROI becomes positive, indicating the recovery of the initial investment.
- Track the evolution of net gains to evaluate the long-term profitability of the project. It is a clear tool for understanding financial performance and a decision-making aid for investors.

Self-consumption Graph + Autonomy + Bills Network

Batteries 24 kWh

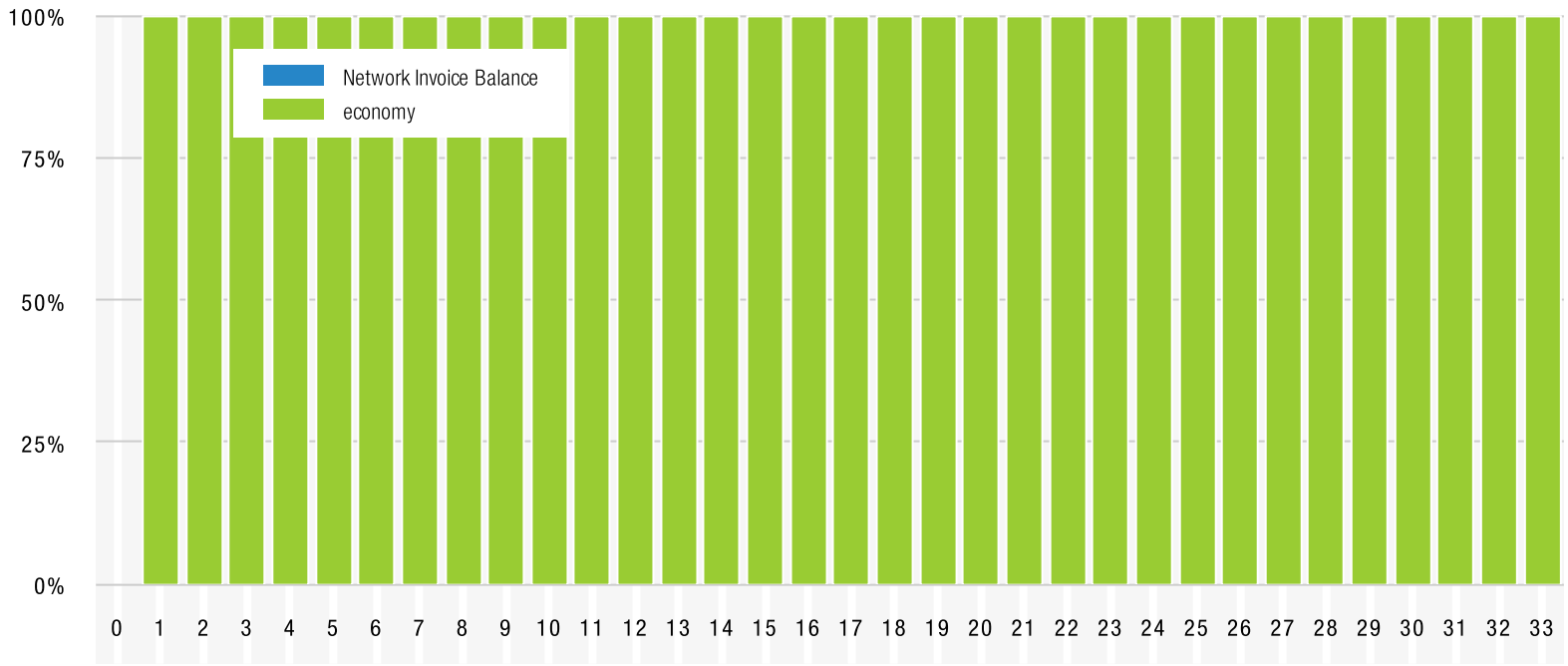


A stacked histogram comparing self-consumption and autonomy savings with public grid bills allows to:

- Visualize the proportion of self-consumed energy that helps reduce the total bill (indicated at the bottom of each bar).
- Illustrate dependence on the public grid (upper part of the bars) and identify times when it is at its maximum.
- Facilitate the analysis of savings achieved through the solar installation as well as periods when improvements (such as adding batteries) could reduce grid-related costs.
- This is an essential chart to demonstrate the financial benefits of a simple self-consumption solar system.

Economy Chart in %
Network Invoice - (Self-consumption + Autonomy)

Batteries 24 kWh



This stacked histogram illustrates the distribution between **self-consumption** (in green) and **grid bills** (in blue) over 20 years.
It is a simple visual tool to demonstrate the **profitability and efficiency of a solar installation** over the long term.

Carbon Footprint

France

https://www.iea.org/countries/france

IEA Electricity Production Sector
Production in GWh

Energy Sources.	GWh	%
Coal	2,038.0	0.4%
Fuel	7,004.0	1.2%
Gas	17,711.0	3.1%
Biomass	7,775.0	1.4%
Waste	4,452.0	0.8%
Solar Thermal	-	-%
Géothermie	128.0	0.0%
Solar PV	23,623.0	4.2%
Wind	47,245.0	8.3%
Nuclear	380,451.0	66.9%
Hydroelectricity	77,461.0	13.6%
Other sources	1,159.0	0.2%
569,047.0 GWh		

CO^2 Content per kWh in Production
in grams of CO^2 per kWh produced and consumed

Energy Sources.	CO^2 Coefficient	CO^2 emission
Coal	1,060.0	3.8
Fuel	730.0	9.0
Gas	418.0	13.0
Biomass	230.0	3.2
Waste	-	-
Solar Thermal	-	-
Géothermie	-	-
Solar PV	20.0	0.8
Wind	12.0	1.0
Nuclear	-	-
Hydroelectricity	24.0	3.3
Other sources	-	-
- g de CO^2 par kWh		

The calculation of a country's carbon footprint allows for:

- Evaluating the total greenhouse gas (GHG) emissions generated by its activities, including industry, transportation, agriculture, and energy consumption.
- Identifying the main sources of emissions to prioritize reduction efforts.
- Taking into account factors such as the carbon footprint of imports and exports to gain a comprehensive overview.
- It is an essential tool for monitoring progress toward climate goals and guiding public policies toward a sustainable transition.

Carbon Footprint

Photovoltaic System

	Batteries 10 kWh	Batteries 15 kWh	Batteries 24 kWh
Carbon Footprint GES 20 years	**(1.02) T CO^2**	**(1.54) T CO^2**	**(2.46) T CO^2**
Annual Production of Photovoltaic System	3,650.00 kWh	5,475.00 kWh	8,760.00 kWh
Gramme CO^2 annuel supprimés	124,239.43 Gr CO^2	186,359.15 Gr CO^2	298,174.63 Gr CO^2
Annual CO^2 emission avoided	0.12 T CO^2	0.19 T CO^2	0.30 T CO^2
Annual CO^2 emission of Photovoltaic system	73,000.00 Gr CO^2	109,500.00 Gr CO^2	175,200.00 Gr CO^2
Annual CO^2 emission of Photovoltaic system	0.07 T CO^2	0.11 T CO^2	0.18 T CO^2
Annual Carbon Balance	0.05 T CO^2	0.08 T CO^2	0.12 T CO^2

The calculation of the carbon balance of a solar installation allows to :

- Evaluate the emissions avoided through the production of renewable energy, compared to conventional supply via the grid (often based on fossil fuels).
- Quantify the positive environmental impact, particularly in terms of tons of CO_2 saved throughout the system's lifespan.
- Highlight that each kWh of self-consumed solar energy directly contributes to reducing the household's carbon footprint.
- It is a tangible demonstration of the future solar energy producer's commitment to a more sustainable lifestyle.