Foreseen investment for PV installations in Georgia

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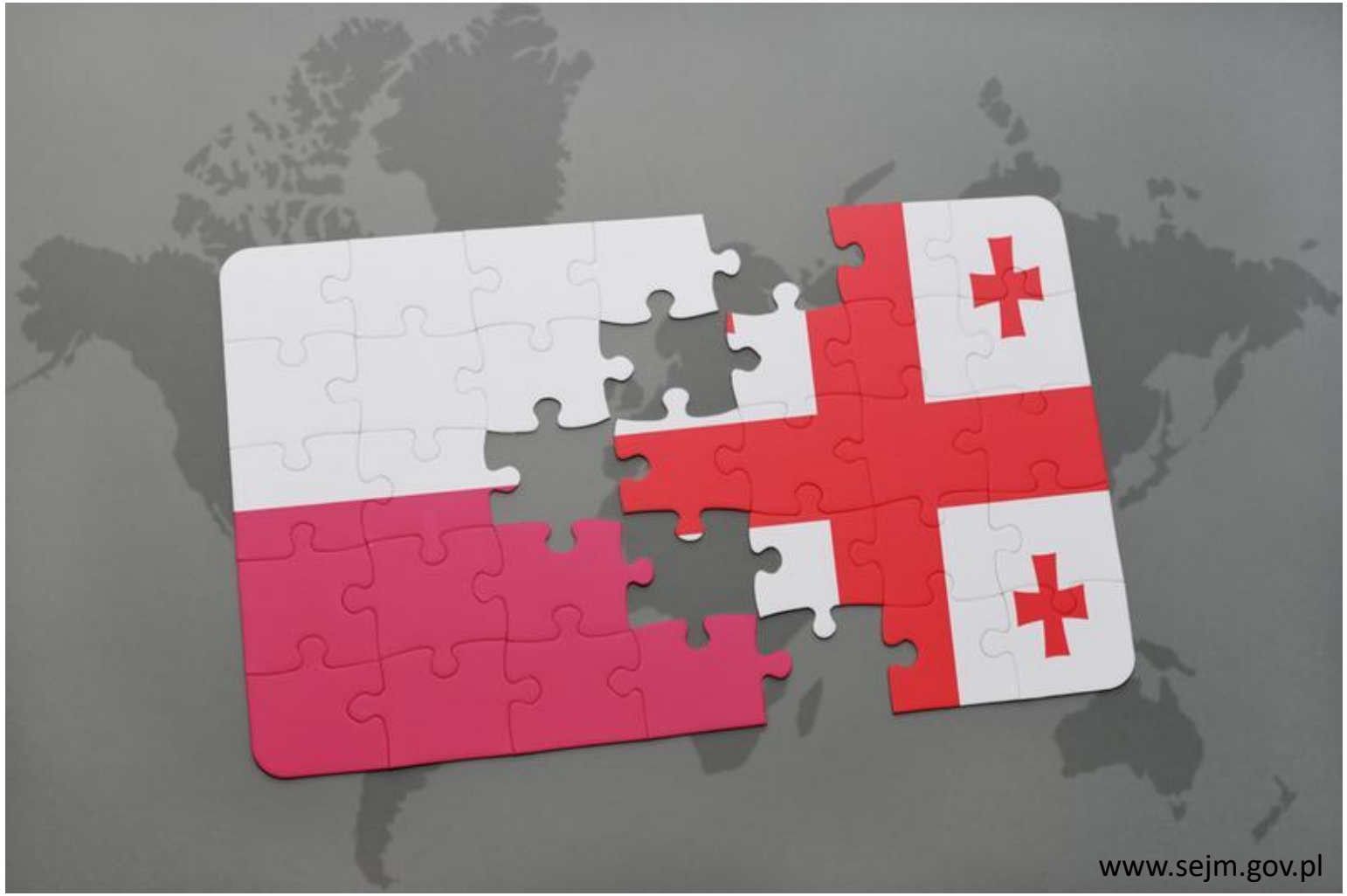
EU - Covenant of Mayors & SECAP

Sustainable Energy & Climate Action Plan → CO_2 emissions reduction

- 20% • 2020
- 40/55% • 2030
- 100% • 2050

Covenant of Mayors for Climate & Energy

UNIDO project: PV for Georgian Cities



UNIDO – PV for Georgian Cities 2019-2022

UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

Initial assessment of potential investments 2019

29 potential projects where initially identified

Gori

Zugdidi

Poti

Chokhatauri

Update of the potential projects 2022

Project portfolio after data update 2022

Gori	
Building	**Address**
City Hall	Grigol Feradze street N 5
Kindergarten #11	Arsena Marabdeli St #1
Kindergarten #20	Near Sukhishvili St
Kindergarten #19	Tskhinvali Highway 1km

Poti	
Building	**Address**
Kindergarten	202, Guria St.
Multifamily house x 37	12, Apkhazeti St.
Kindergarten	154, Alexander Chavchavadze St
Multifamily house x2	158, Alexander Chavchavadze St
Individual house x35	231, Alexander Chavchavadze St

Zugdidi	
Building	**Address**
City hall	Rustaveli St N90
Public building	Rustaveli St N79
Public School #11	Tabukashvili St N29
IDP's multifamily houses x 2	Laghidze St N4

Chokhatauri	
Building	**Address**
School 1	Tsereteli Street N 3
City Hall	Tsereteli Street N 2
Chokhatauri Public School 3	Mari street N 1
School 2	Dumbadze Street N 35
Art. Palase	Dumbadze Street N 20 A

Benefits of PV

- Not only emissions reduction
  - cheap & competitive on the market
  - huge market – a lot of technologies & manufactures
  - easily scalable
  - energy independence
  - local energy generation

Foreseen benefits of the Project

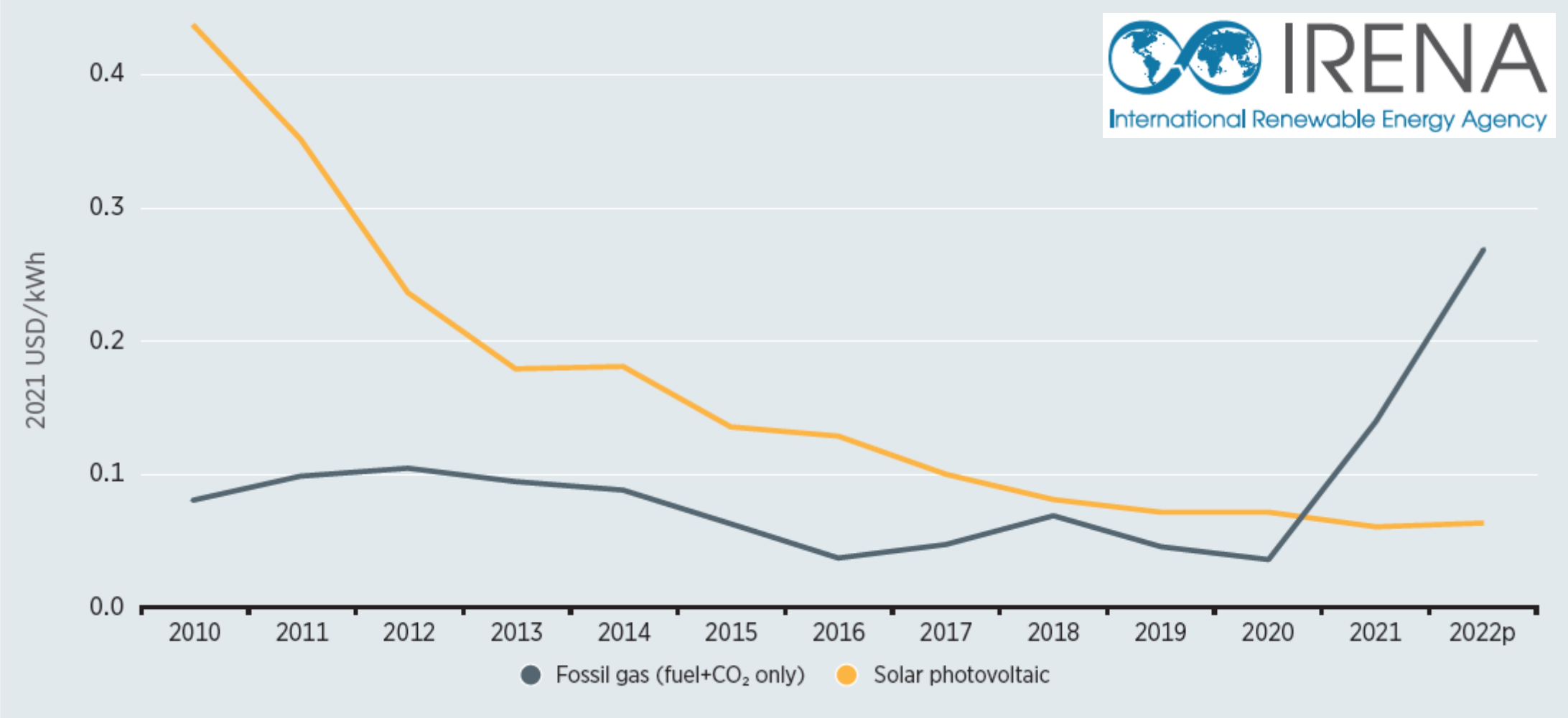
Direct:

- Lower electricity bills for municipalities.
- Lower CO_2 emissions
- Reduction of problems related to the lack of energy supply
- Proof that PV instalations in Georgia are safe and profitable

Indirect/long term benefits:

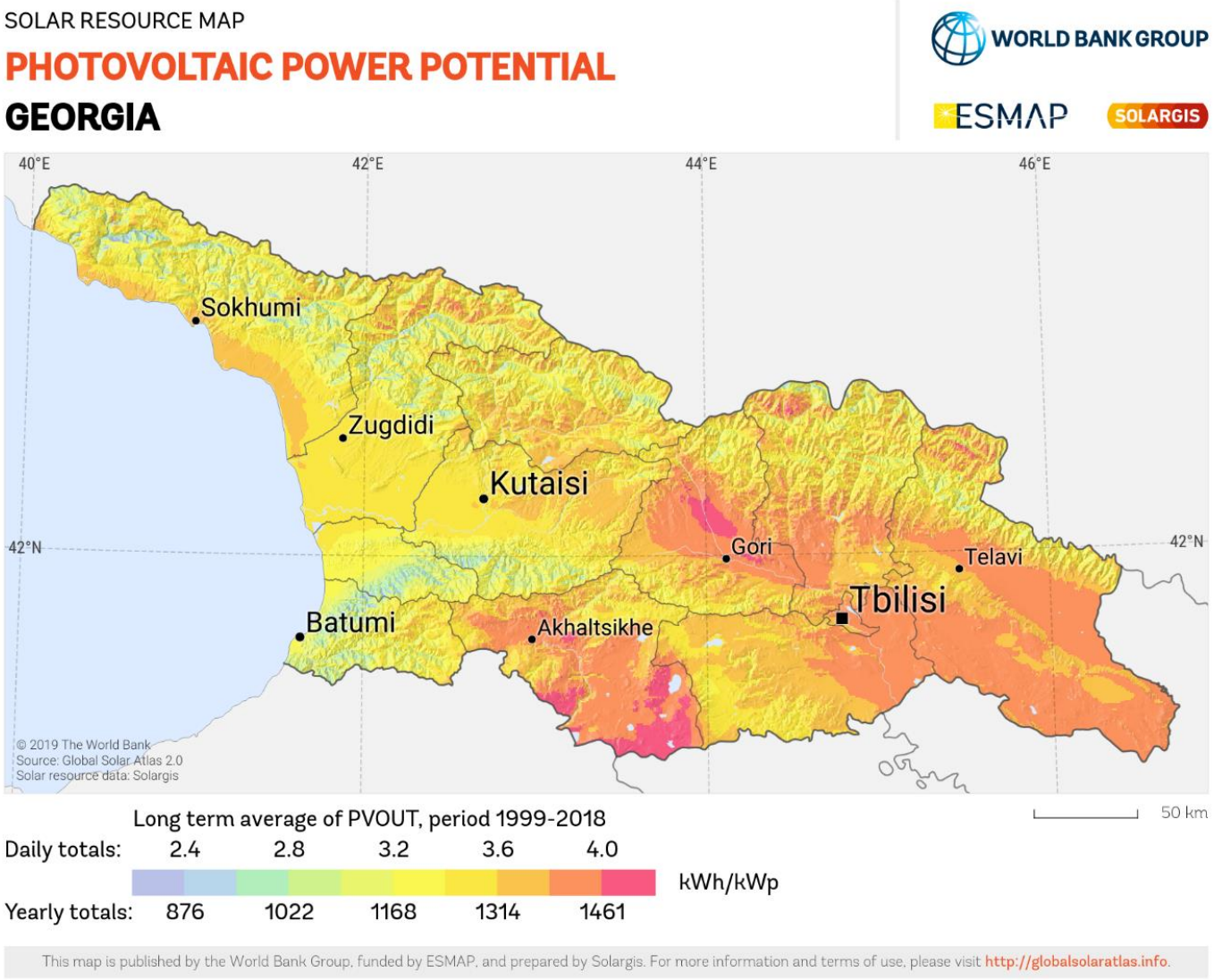
- Increasing the awareness of Georgian society regarding photovoltaic investments & posibilities
- Stimulating the Georgian economy (new jobs in innovative sectors)

Economic attractivnes of PV is Growing



IRENA (2022), Renewable Power Generation Costs in 2021, International Renewable Energy Agency, Abu Dhabi

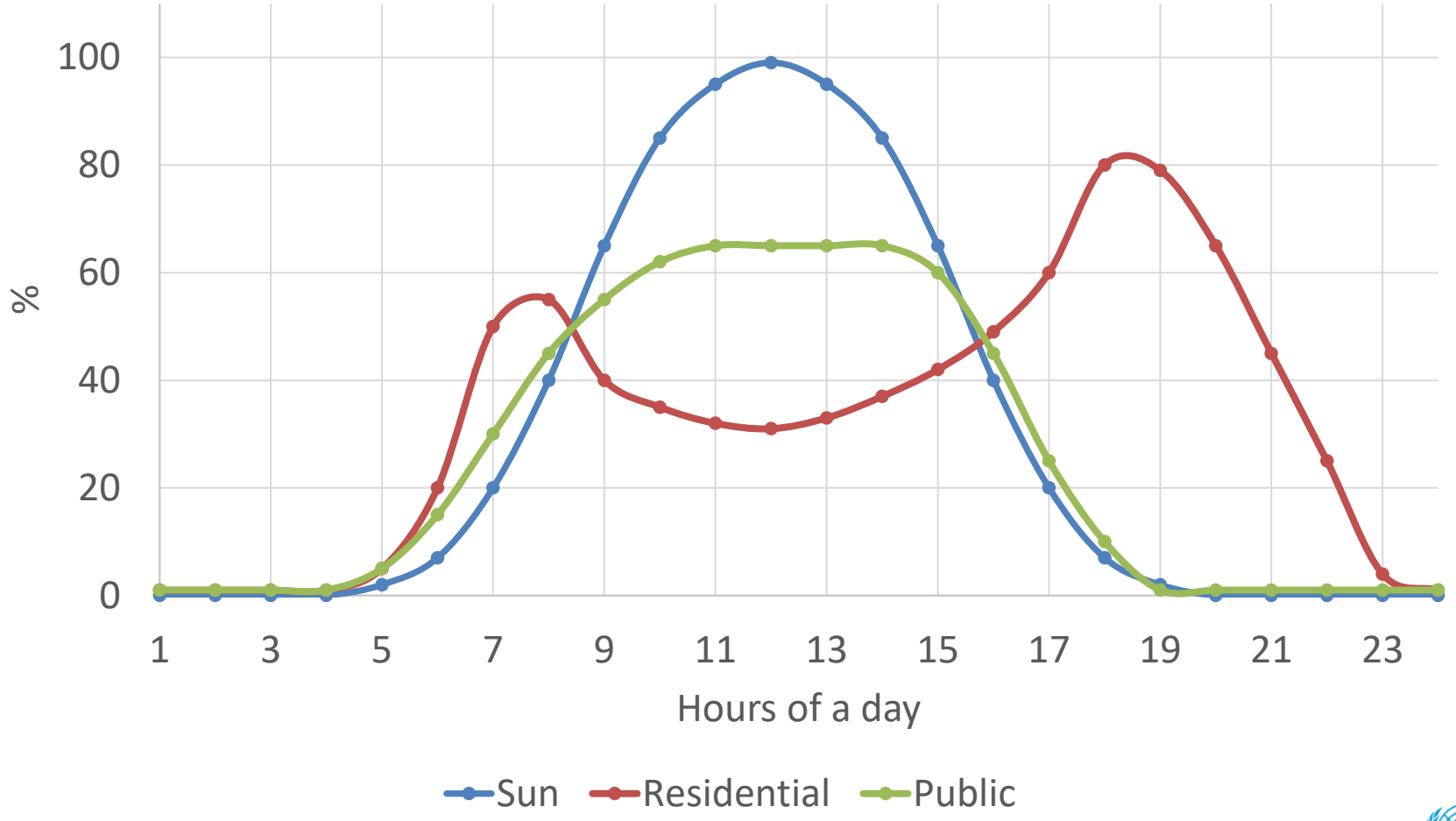
PV conditions in Georgia



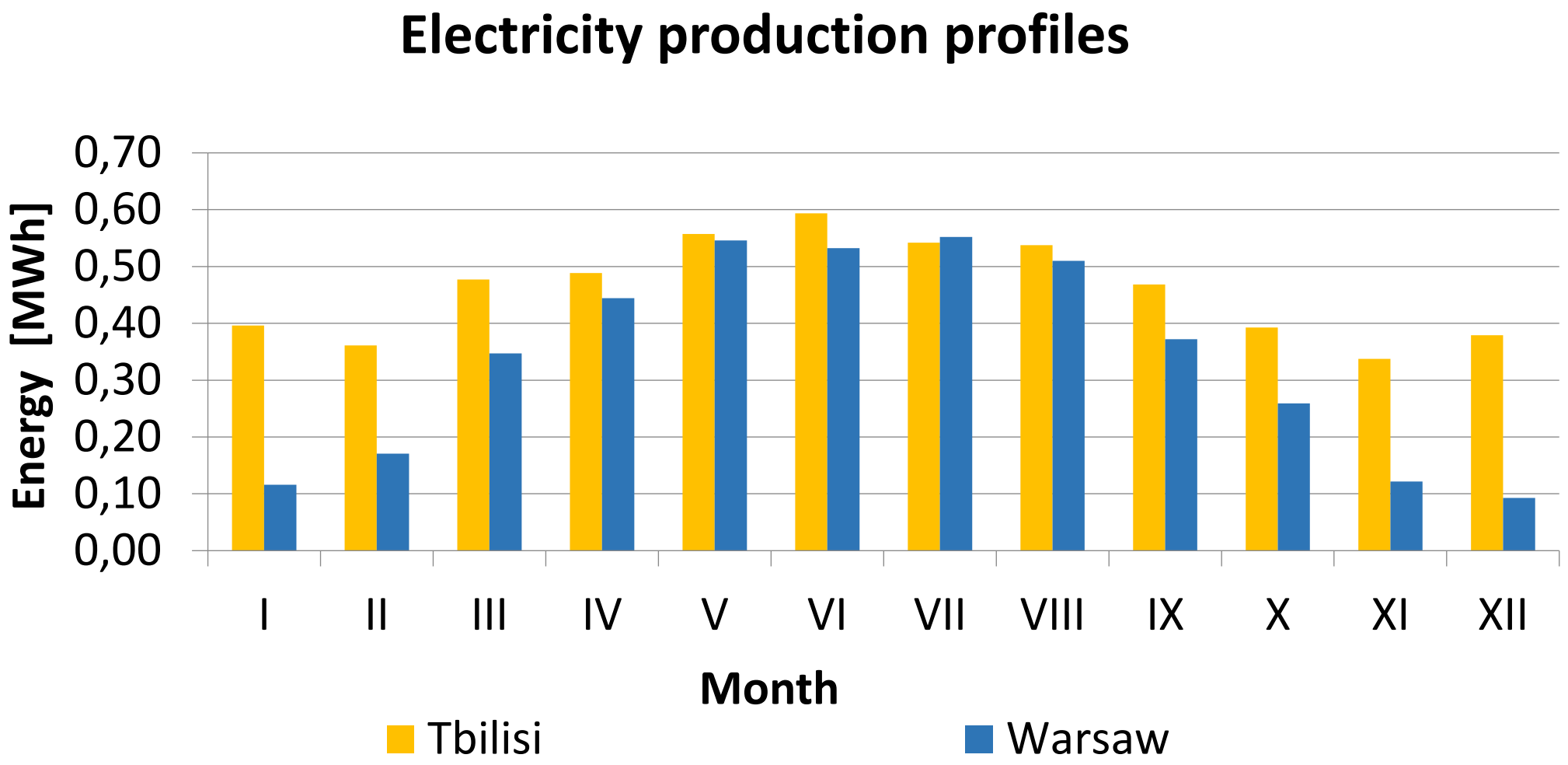
Coherence between solar radiation and energy consumption profiles

The specific prosumer case: residential house vs public building

Opportunity of high share of energy self-consumption

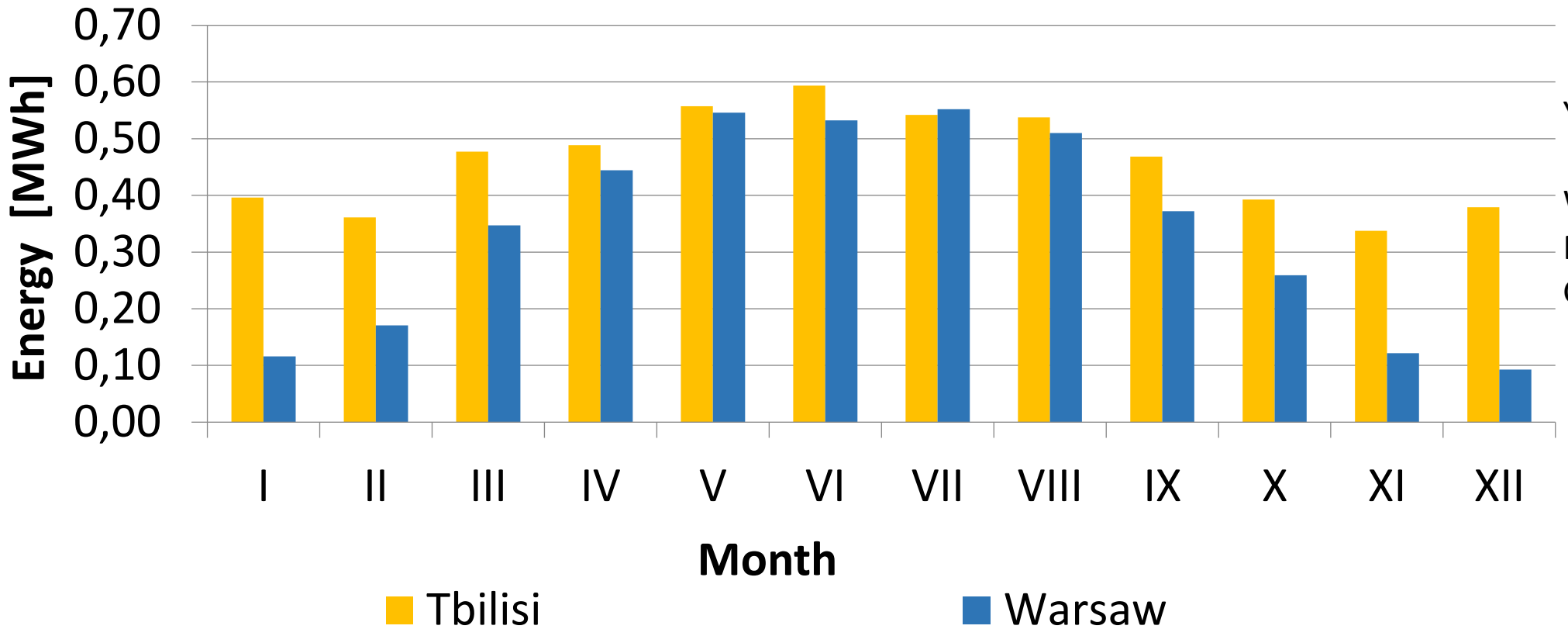


Poland vs. Georgia



Poland vs. Georgia

PV electricity production profiles

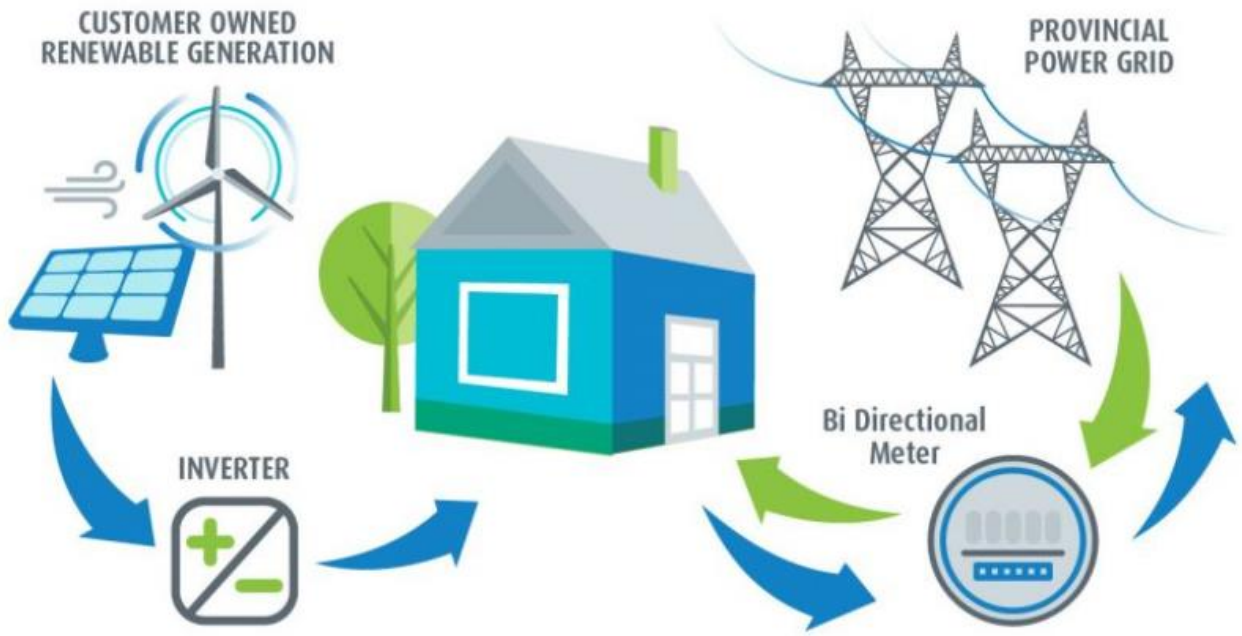


Year GE/PL: **136%**

Winter/summer:
PL **20%**
GE **66%**

Support Systems for PV Prosumers

- **Net-metering** - The model works on a basis of two-way energy measurement. In this scheme energy fed into the grid can be retaken free of charge.

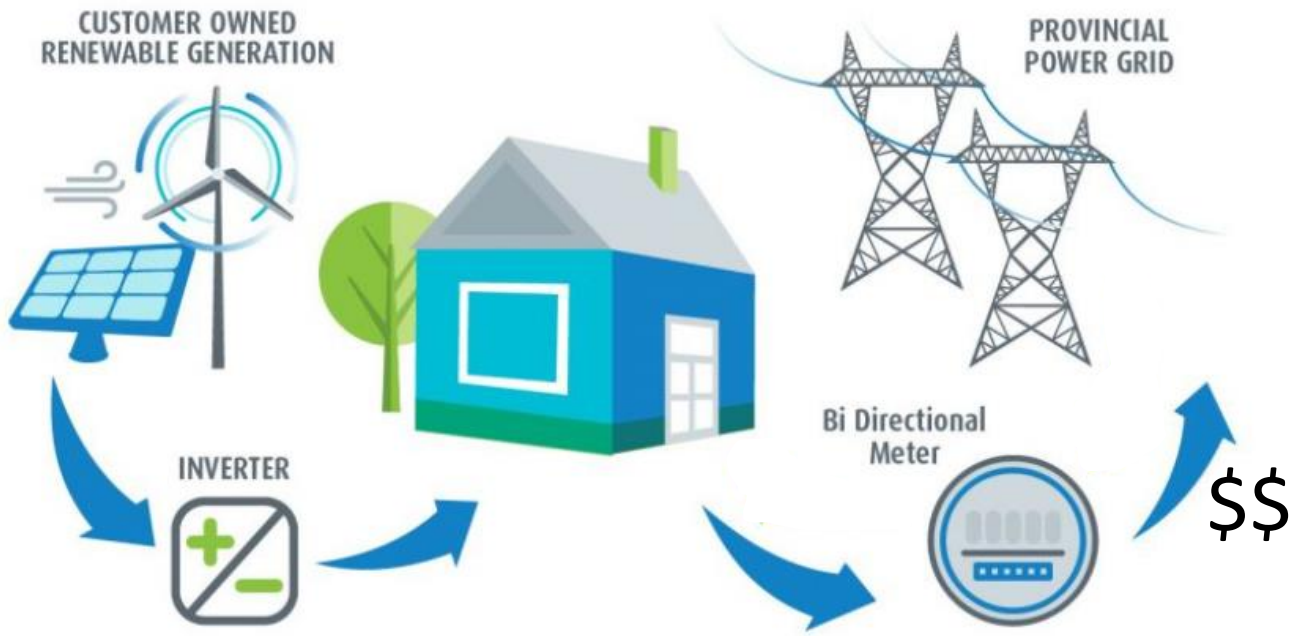


The excess energy fed into the grid can be recovered from the grid

http://mmbsolution.com/net-metering/

Support Systems for PV Prosumers

- **Net-billing** - In this scheme prosumer pays normally for energy taken from the grid and gets compensated for all of the energy fed into it.



The excess energy is **sold based on energy price**

http://mmbsolution.com/net-metering/

Support System for PV Prosumers

The biggest difference:

- Net metering is energy-based mechanism
- Net billing is price-based mechanism

Comparison of current support systems in Pl and GE

	PL	GE
RES type	Every RES (wind, hydro, PV)	Every RES (wind, hydro, PV)
Max micro RES power	50 kWp	500 kWp
Prosumer	Owner of family house or NGO	All type of energy consumers
Surplus energy	Net-metering (2016) Net-billing (2022)	Net-metering (2016)

Poti – case study

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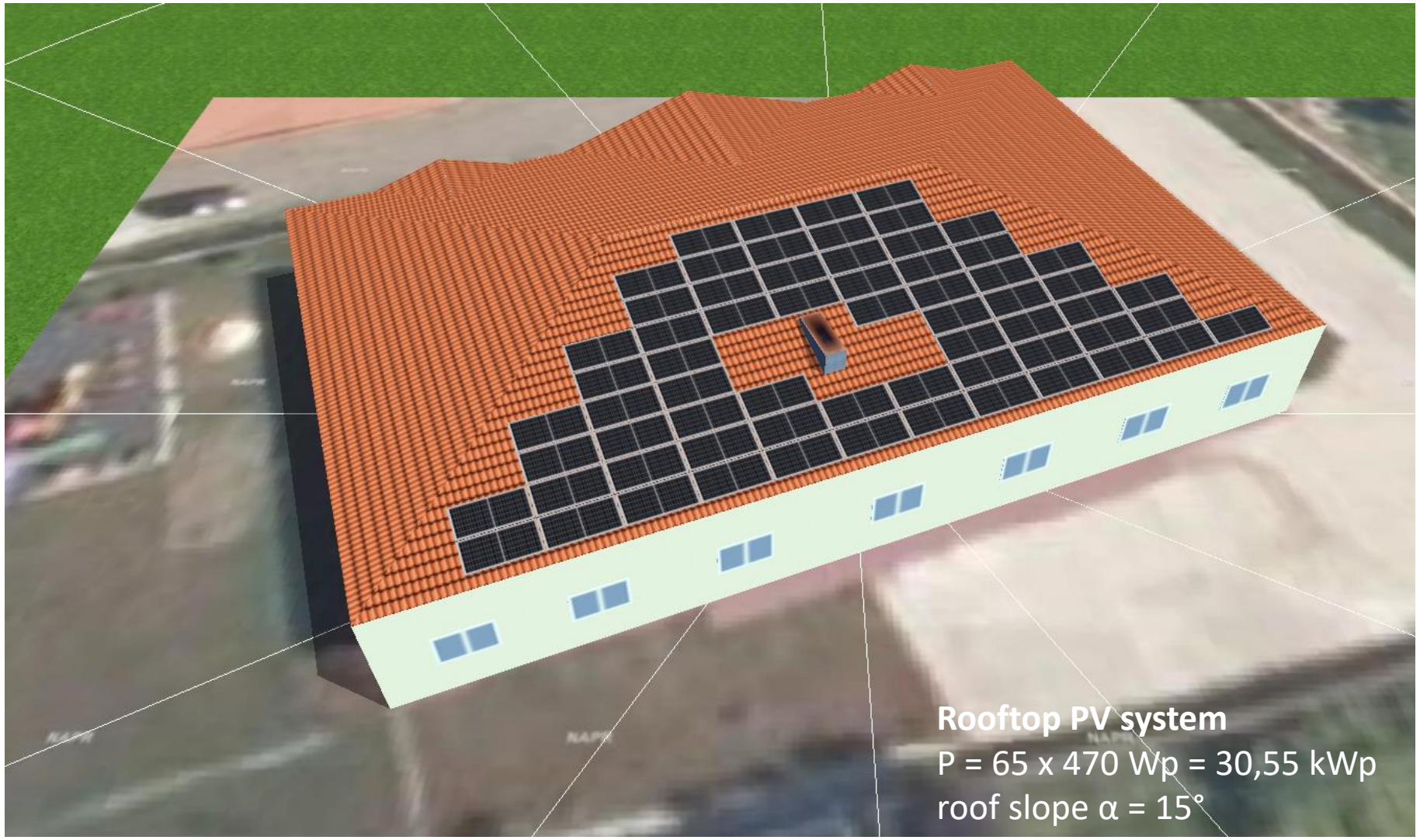
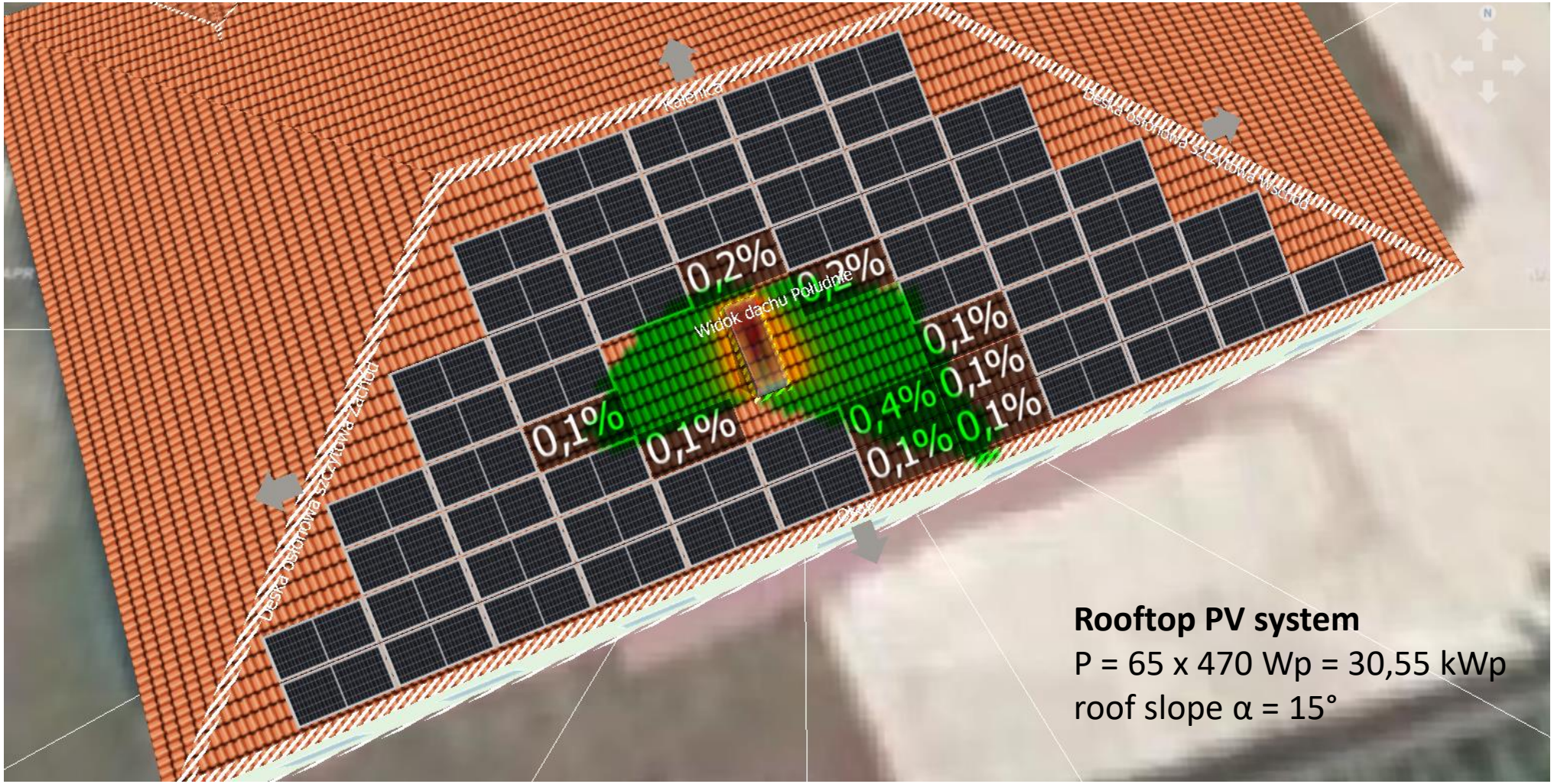
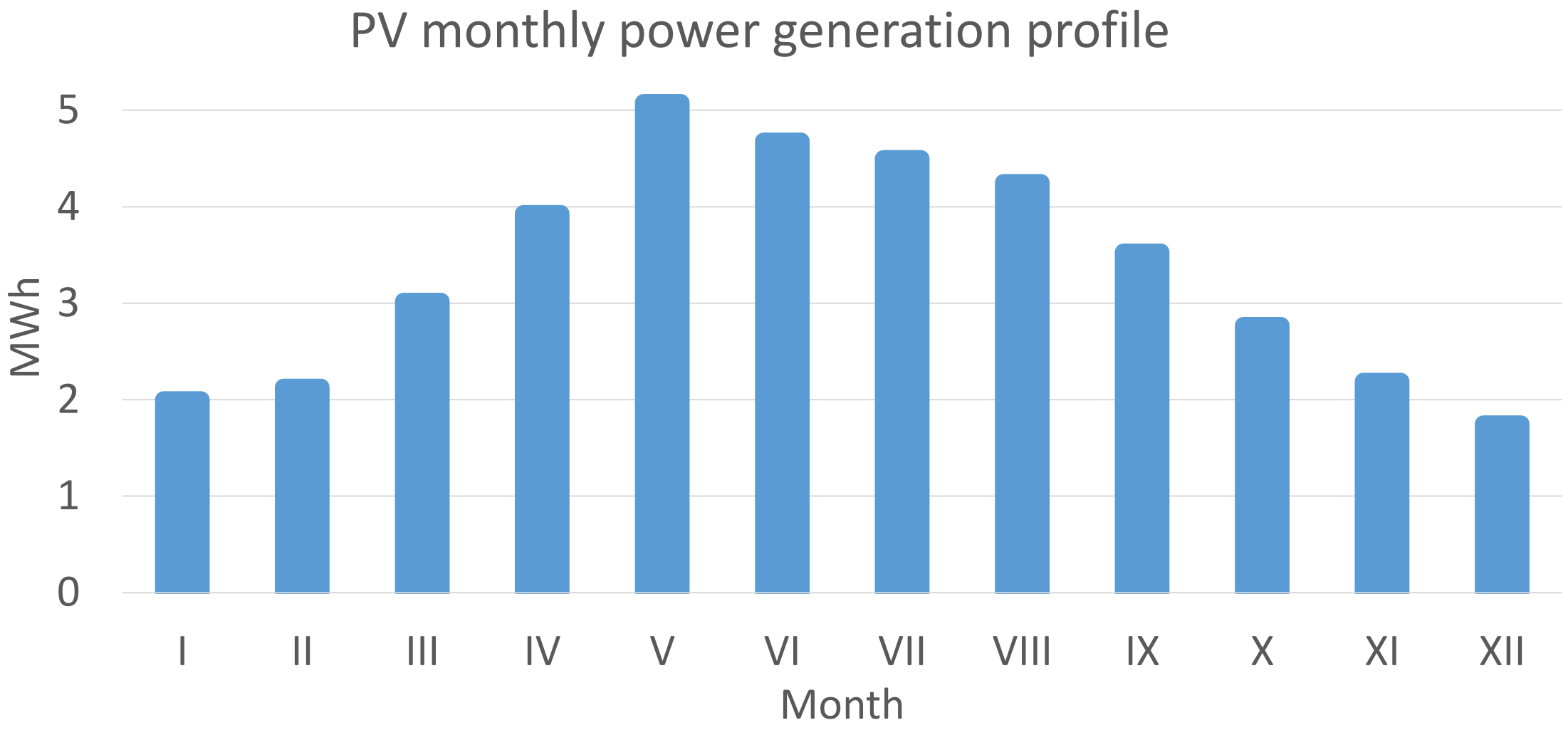


Poti – case study



Rooftop PV system
P = 65 x 470 Wp = 30,55 kWp
roof slope α = 15°

Poti – case study



Poti – case study- assumptions

PV characteristics

Capacity 31 kWp (65 PV modules)

Yearly production decrease = 0,6%

1st year Energy production = 1270 kWh/kWp

Exchange rate	
GEL/PLN	0,6
PLN/GEL	1,66
EUR/PLN	4,69

Capex (2022)		
PLN	4500	PLN/kWp
GEL	2711	GEL/kWp
EUR	959	EUR/KWp

Economic assumptions

Capital cost – 15%

OPEX- 0 /year

Electricity cost (variable part, energy + distribution) - 0,44 GEL/kWh

Energy price growth rate based on National Bank of Georgia forecast of inflation.

Poti – case study- results

	GEL	PLN	EUR
LCOE [kWh]	0,29	0,48	0,10
NPV	67 121	111 422	23 757
IRR	29,99%		
PP	4,96		
DPP	6,27		

LCOE - Levelized Cost of Energy
NPV - Net Present Value
IRR - Internal Rate of Return
PP - Payback Period
DPP - Discounted Payback Period

Poti – case study- results

Currnet energy price in Georigia: 0,44 GEL/kWh

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Payback time for less than 7 years!

Financial model 2019 vs 2022

The results of our financial simulation in 2022 is better compered to model prepared in 2019.

Main differences:

1. Higher current electricity price than in 2019
2. Decreased costs of PV installation
3. Continuous adjustment of the Georgian prosumer support system

Next step: Technical Tour

- On-site visits
- Gathering missing data
- Confirmation of technical and economic assumptions
- Final selection of 10-12 buildings for the preparation of feasibility study and for collection of financing offers

Roadmap for foreseen PV Investment

2019-2021

Project idea development

2022-2023

choosing buildings and finding financing options

2023-2024

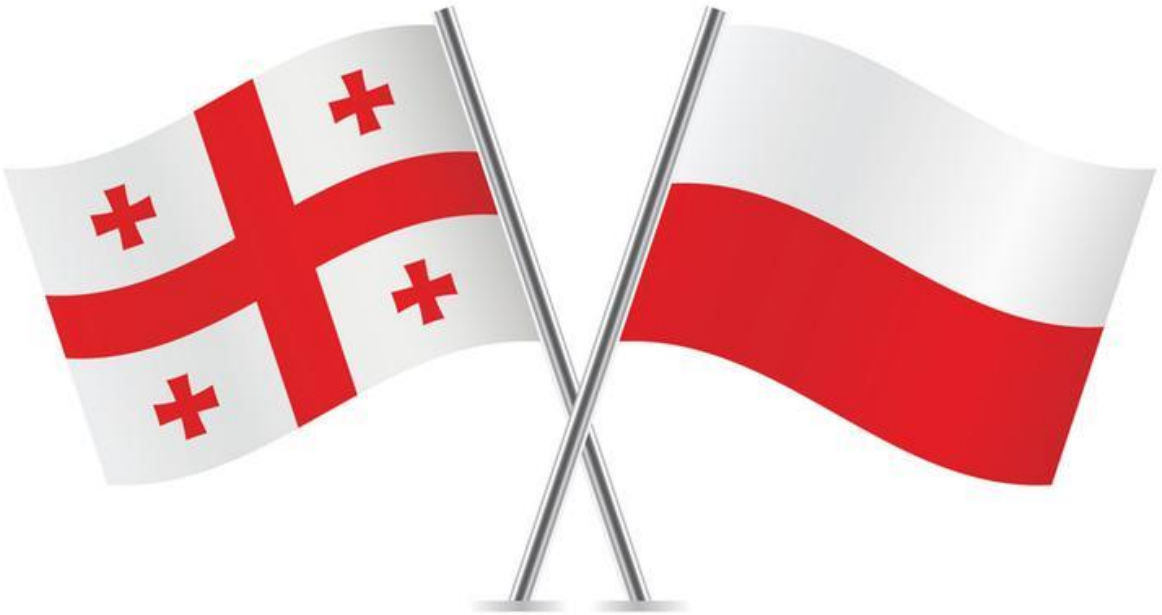
Project implementation

Potential financing

Short list of institutions to contact :

1. European Investment Bank (EIB)
2. European Bank for Reconstruction and Development (EBRD)
3. World Bank
4. Georgia | KfW Development Bank
5. Municipal Development Fund of Georgia
6. Bank Gospodarstwa Krajowego (BGK) – Polish Development Bank
7. …

Potential financing – example form Polish Development Bank

Buyer's bank credit	
Main characteristics	Financing of investment exports, based on the financial standing of the importer's bank
Repayment period	Between 2 and 5-7 years
Amount of support	Up to 85% of the contract (according to the OECD Consensus) Minimal amount: 1 m EUR
Financing costs	▪ Fixed rate (CIRR) or a floating rate ▪ Administrative costs ▪ KUKE insurance (Polish ECA)
Currencies	▪ EUR ▪ USD

Discussion: exchange of experiences and information