

How we can move forward, incentivizing the development of decentralized renewable energy generation and storage in Greece?

Assoc. Professor Dr. Alexandros Flamos

Director of Technoeconomics of Energy Systems Laboratory (TEESlab)

Dept. of Industrial Management & Technology, University of Piraeus (UNIPI)

Editor in Chief at Energy Sources, Part B: Economics, Planning, and Policy

Vassilis Stavrakas, MSc. Eng.

Ph.D. Researcher at Technoeconomics of Energy Systems Laboratory (TEESlab)

Dept. of Industrial Management & Technology, University of Piraeus (UNIPI)

Paris in Practice: Understanding the Risks and Uncertainties

Tuesday 6th November 2018

MODELING TOOLS - TEEM TOOLBOX



Agent-based Technology
adOption Model



Demand-REsponse
Model



Modeling toolbox to
perform quick simulations
as part of an iterative
participatory process
aiming to provide answers
to “what if” scenarios

Adaptive policy
pathways Model

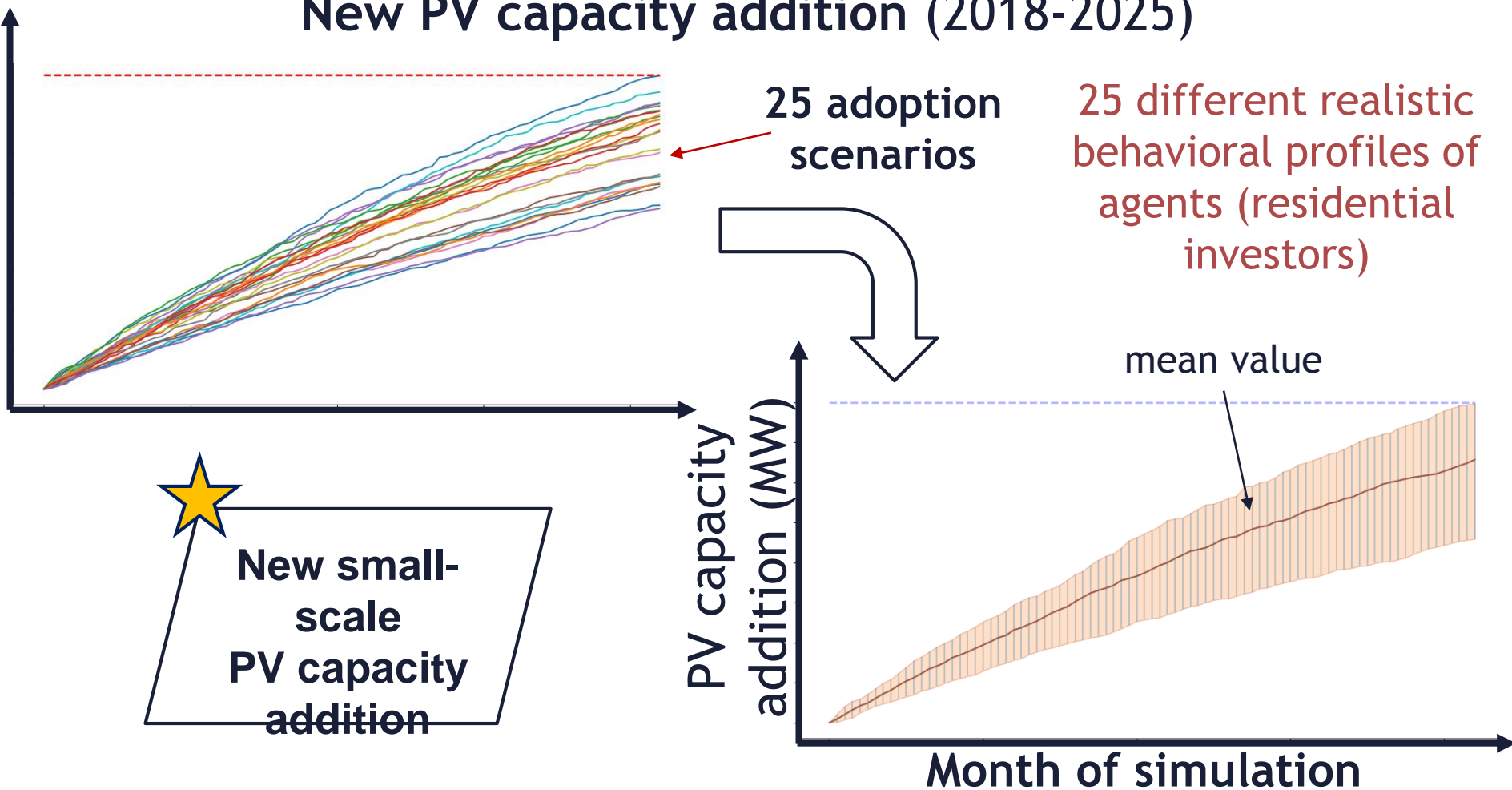


Wholesale Electricity
Market Simulator



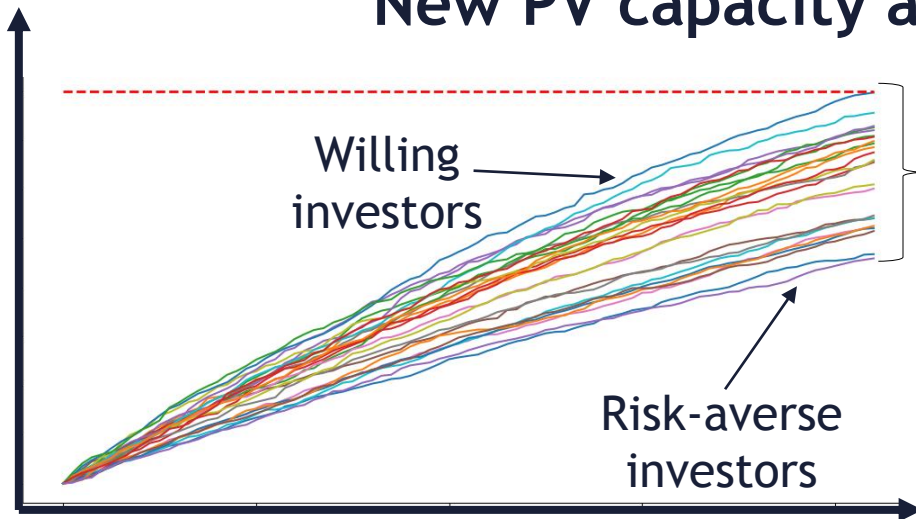
FURTHER DEPLOYMENT OF SMALL-SCALE PV - EXAMPLE (1/2)

New PV capacity addition (2018-2025)



FURTHER DEPLOYMENT OF SMALL-SCALE PV - EXAMPLE (2/2)

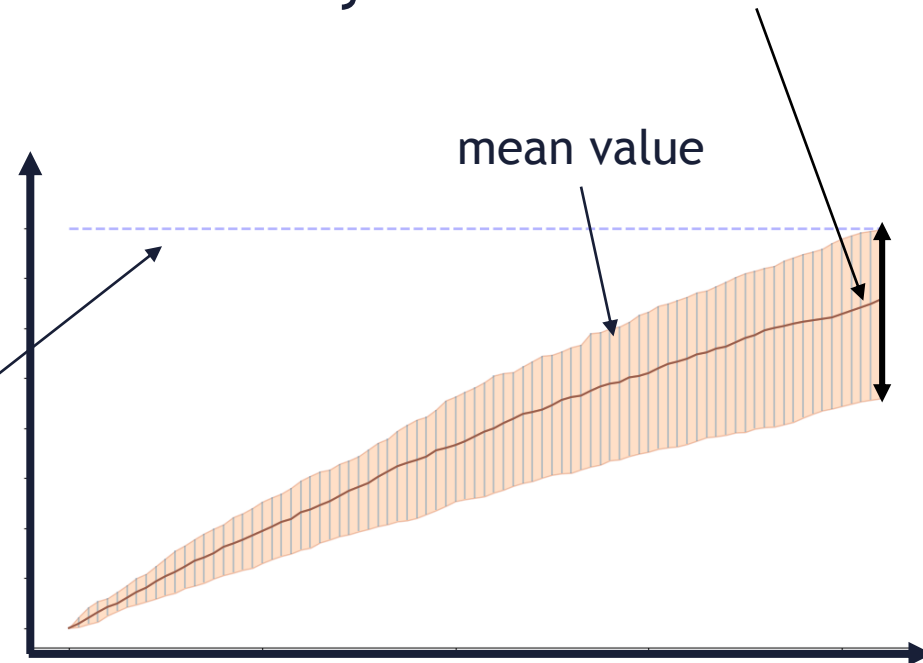
New PV capacity addition (2018-2025)



Quantifying adoption uncertainty

█ Variance of outcomes

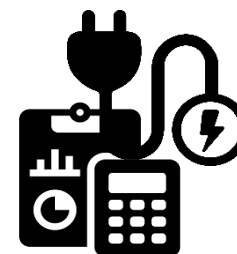
400 MW - Capacity achieved with Feed-in-Tariffs in Greece from 2010-2013



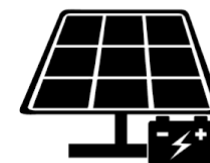
FURTHER DEPLOYMENT OF SMALL-SCALE PV IN GREECE (1 / 12)

“*What if*” we promote further deployment of small-scale PV in Greece, under :

➔ The current Net-Metering scheme



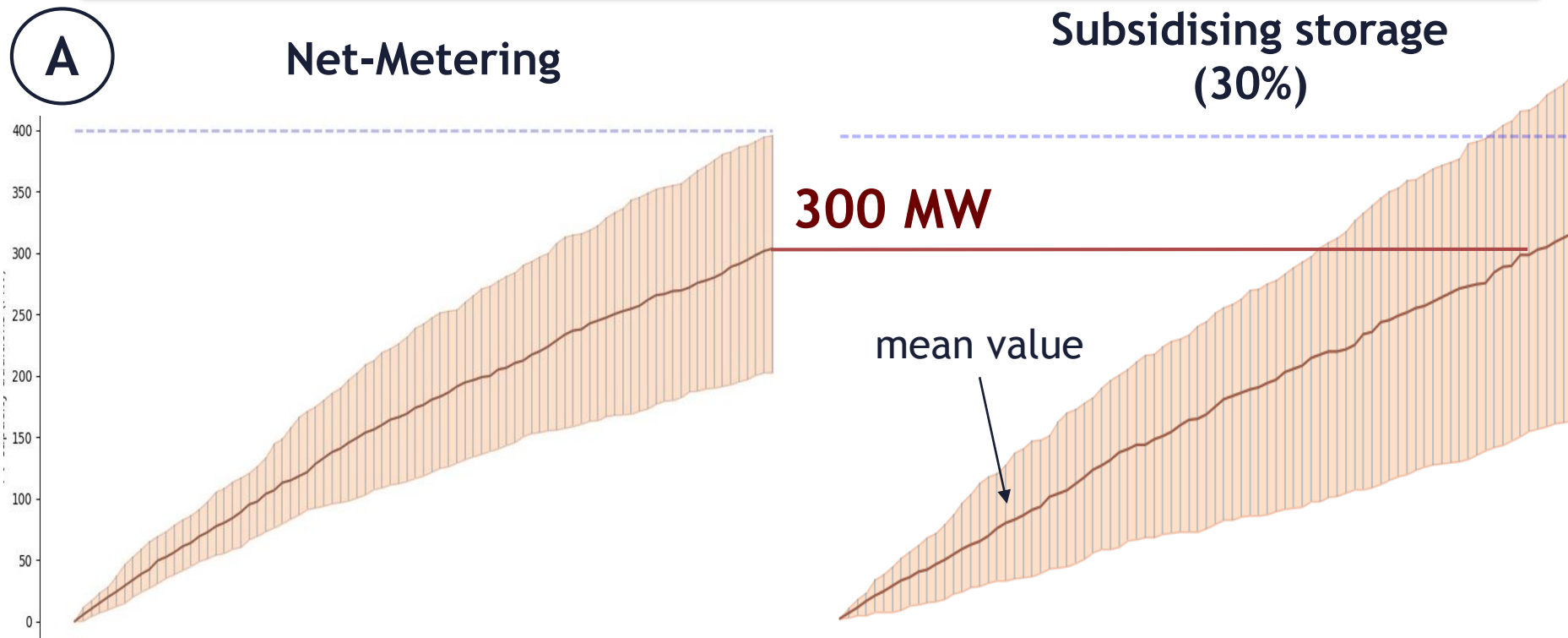
➔ A storage subsidy of 30%



With...

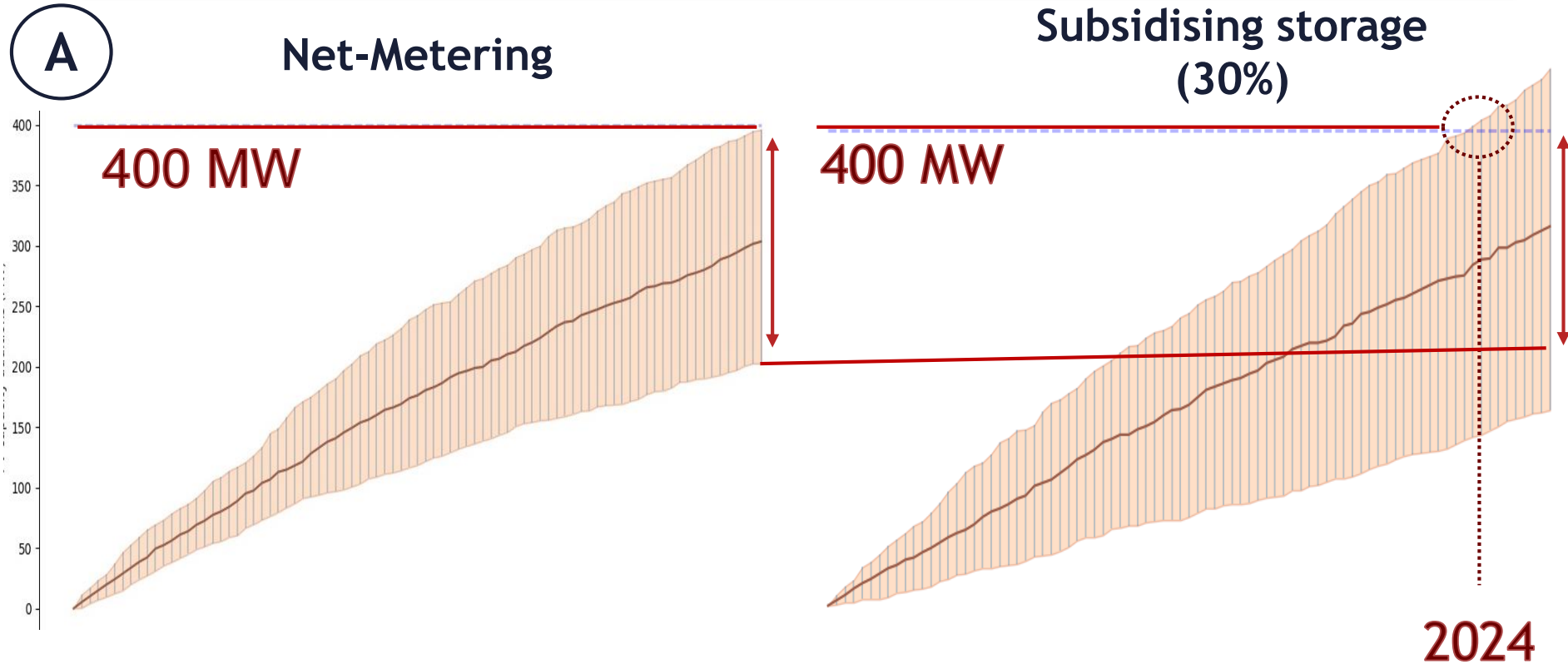
...No changes in the current retail price

FURTHER DEPLOYMENT OF SMALL-SCALE PV IN GREECE (2 / 12)



In average, subsidising storage (30%) seems almost equally effective with the current Net-Metering.

FURTHER DEPLOYMENT OF SMALL-SCALE PV IN GREECE (3 / 12)

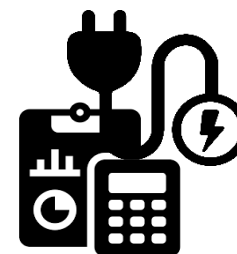


However, variance is much bigger in the case of 30% subsidy of storage - implying a much higher uncertainty on the agents side.

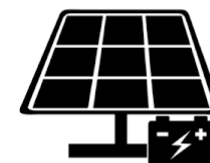
FURTHER DEPLOYMENT OF SMALL-SCALE PV IN GREECE (4/12)

“*What if*” we promote further deployment of small-scale PV in Greece, under :

⇒ The current Net-Metering scheme



⇒ A storage subsidy of 30%



With...

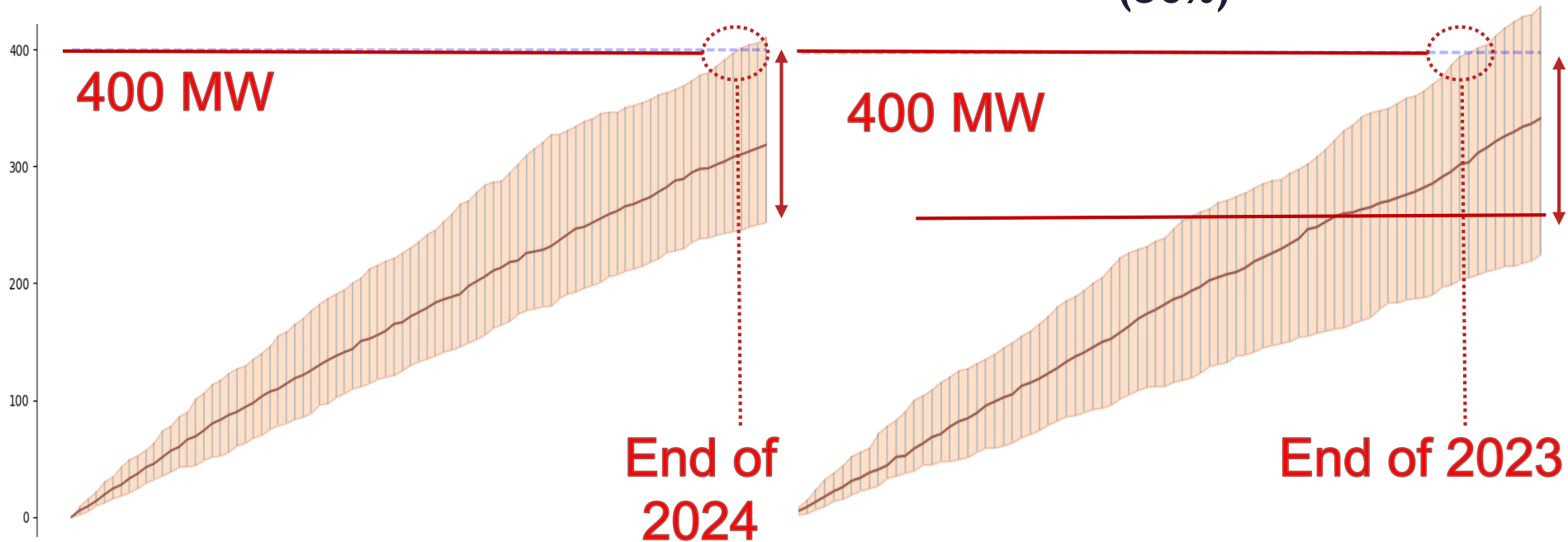
...8.5% annual increase in the current retail price

FURTHER DEPLOYMENT OF SMALL-SCALE PV IN GREECE (5 / 12)

B

Net-Metering

Subsidising storage
(30%)



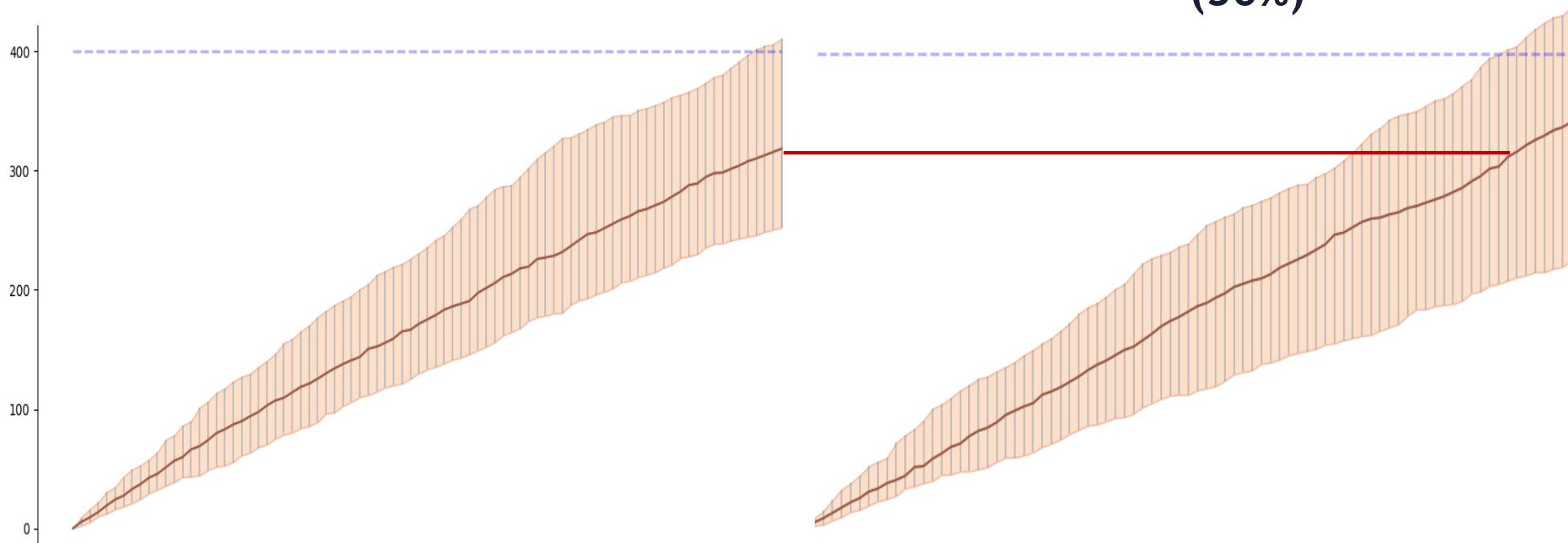
Subsidising storage (30%) presents similar effectiveness to the current Net-Metering

FURTHER DEPLOYMENT OF SMALL-SCALE PV IN GREECE (6 / 12)

B

Net-Metering

Subsidising storage
(30%)

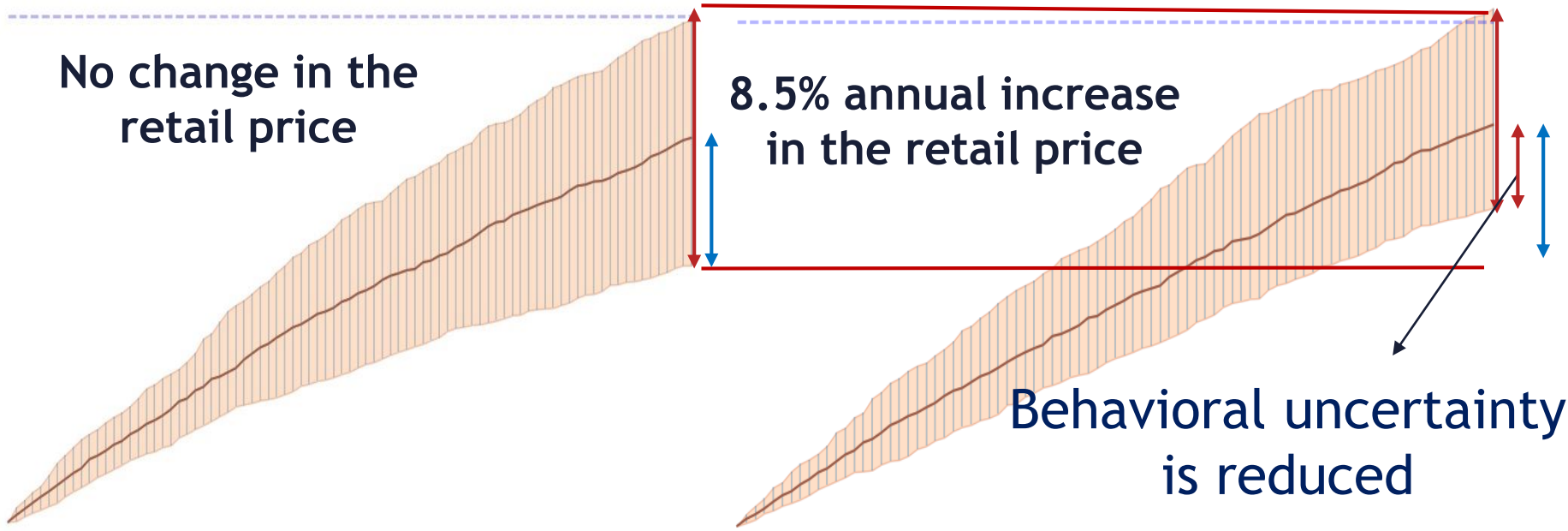


In both schemes consumers (agents) form a more **clear perception** of investment **profitability** & the variance is significantly reduced

FURTHER DEPLOYMENT OF SMALL-SCALE PV IN GREECE (7/12)

B

Net-Metering

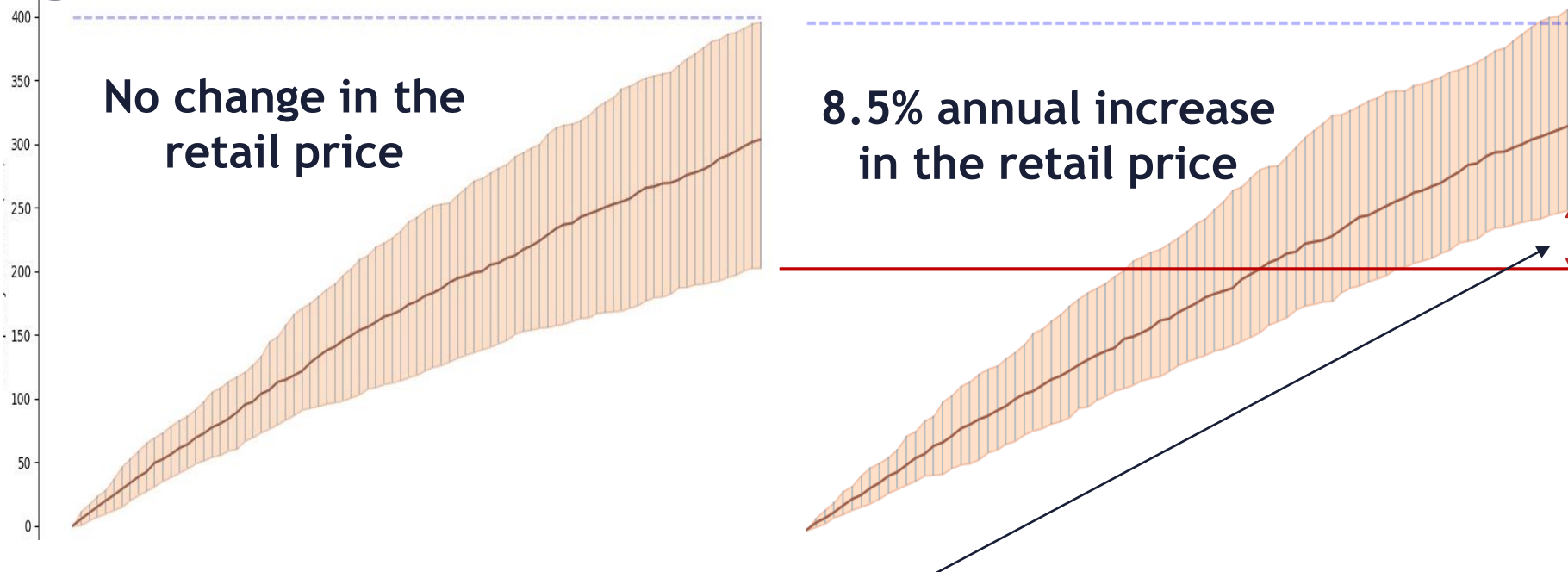


The increase of retail price mainly affects the perception of risk averse investors → they recognize the increased benefits for “prosumers”

FURTHER DEPLOYMENT OF SMALL-SCALE PV IN GREECE (8/12)

B

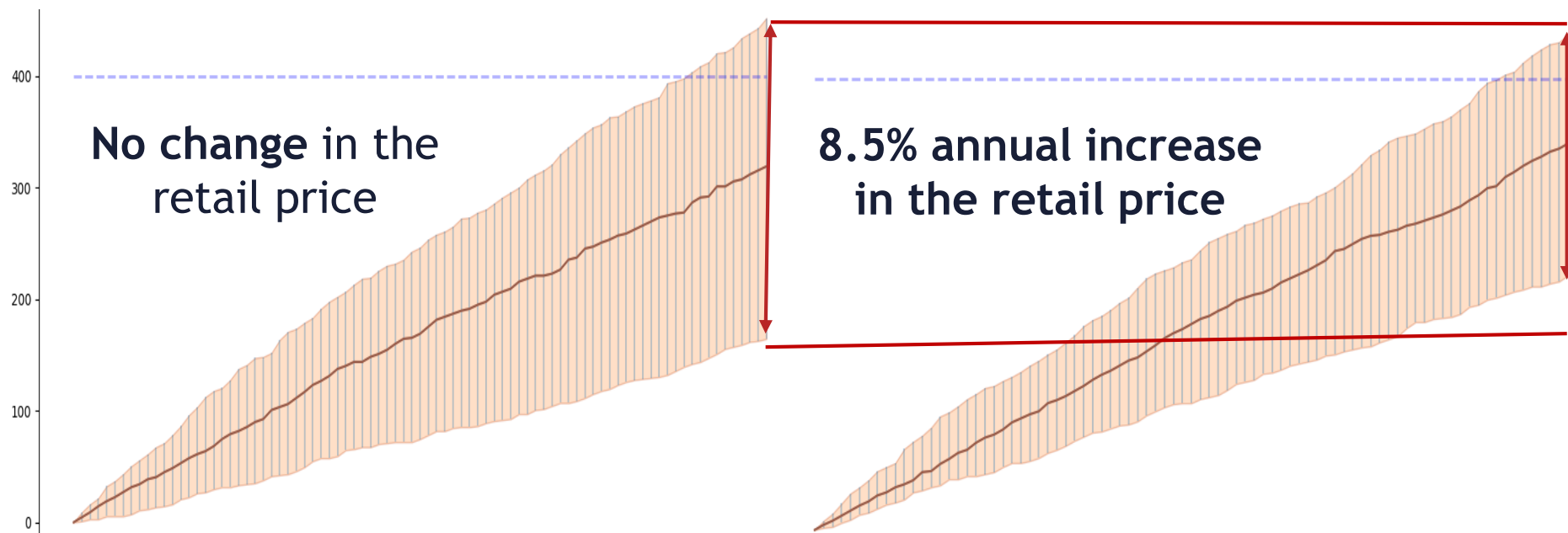
Net-Metering



....since they gain a more explicit perception of the profitability of the scheme over the years

B

Subsidising storage (30%)



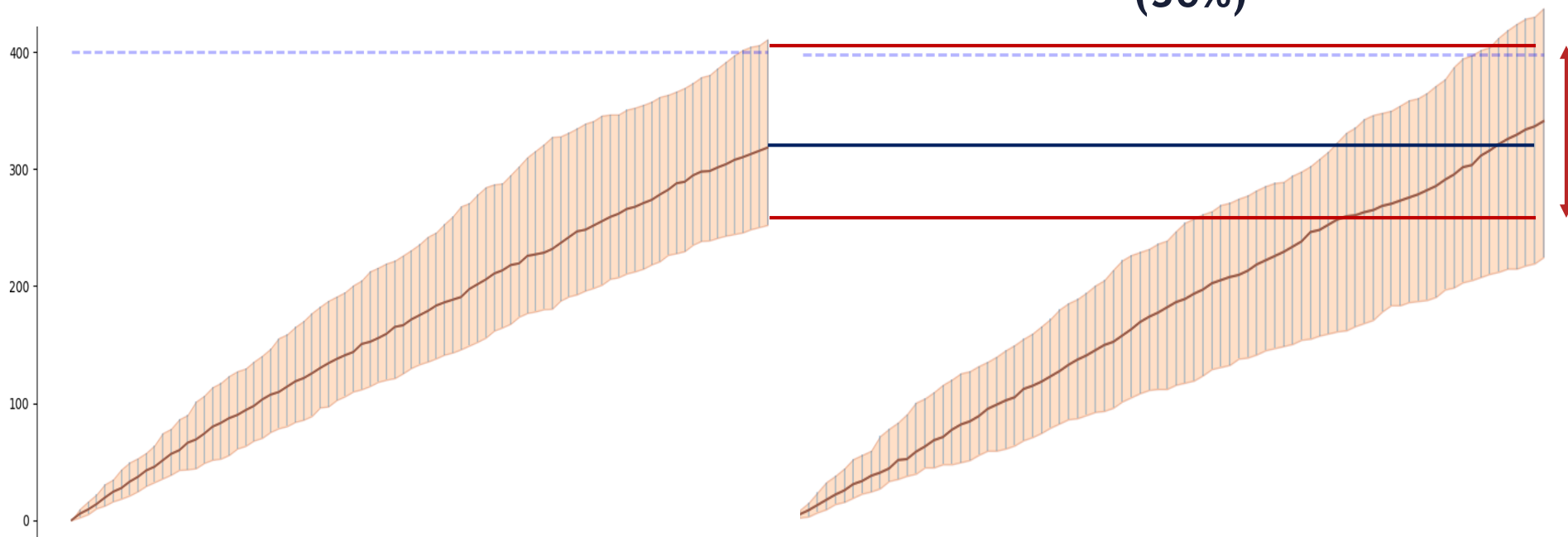
Same applies for the case of the 30% storage subsidy scheme

FURTHER DEPLOYMENT OF SMALL-SCALE PV IN GREECE (10/12)

B

Net-Metering

Subsidising storage
(30%)



Subsidising storage (30%) presents similar effectiveness - however, higher variance of outcomes than Net-Metering

FURTHER DEPLOYMENT OF SMALL-SCALE PV IN GREECE (11/12)



TRANSrisk

TRANSITION PATHWAYS AND RISK ANALYSIS
FOR CLIMATE CHANGE POLICIES

... “*What if*” we promote further deployment of small-scale PV in Greece, under :

a storage subsidy of 50% ???

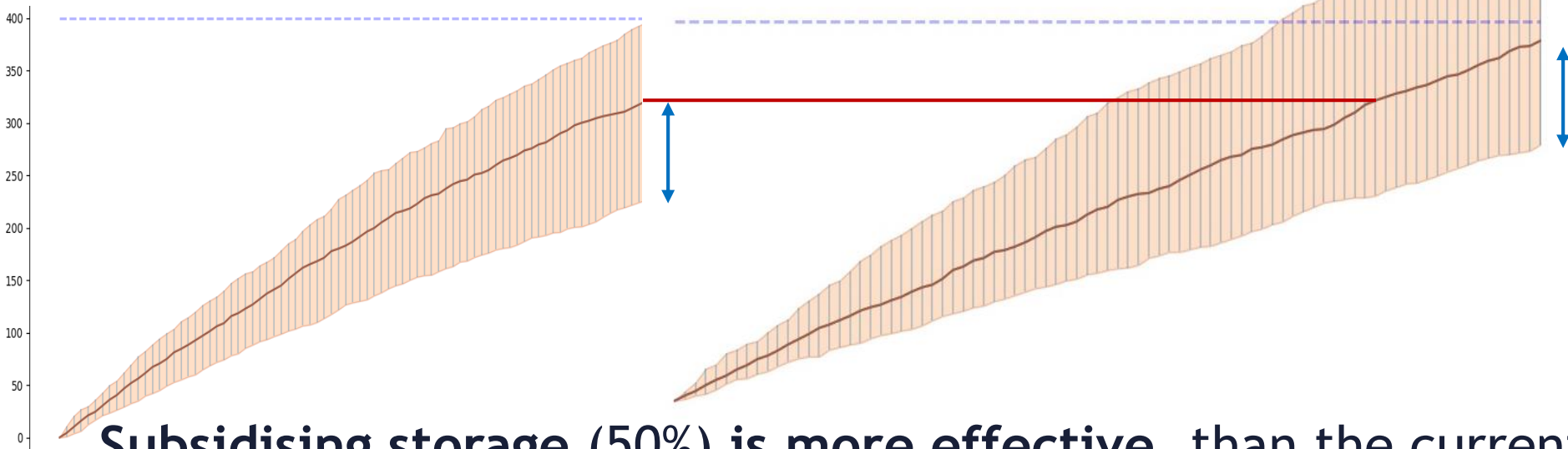


FURTHER DEPLOYMENT OF SMALL-SCALE PV IN GREECE (12/12)

C

Net-Metering

Subsidising storage
(50%)



Subsidising storage (50%) is more effective, than the current Net-Metering and variance of risk averse agents' scenarios is low - indicating the clear perception of profitability.

NEED FOR ADAPTIVE POLICY PATHWAYS...(1 / 3)

So ...

... What should we do ???



**Especially striving towards National RES Targets of
2030 & 2050**

NEED FOR ADAPTIVE POLICY PATHWAYS... (2 / 3)

So ...



... What should we do ???

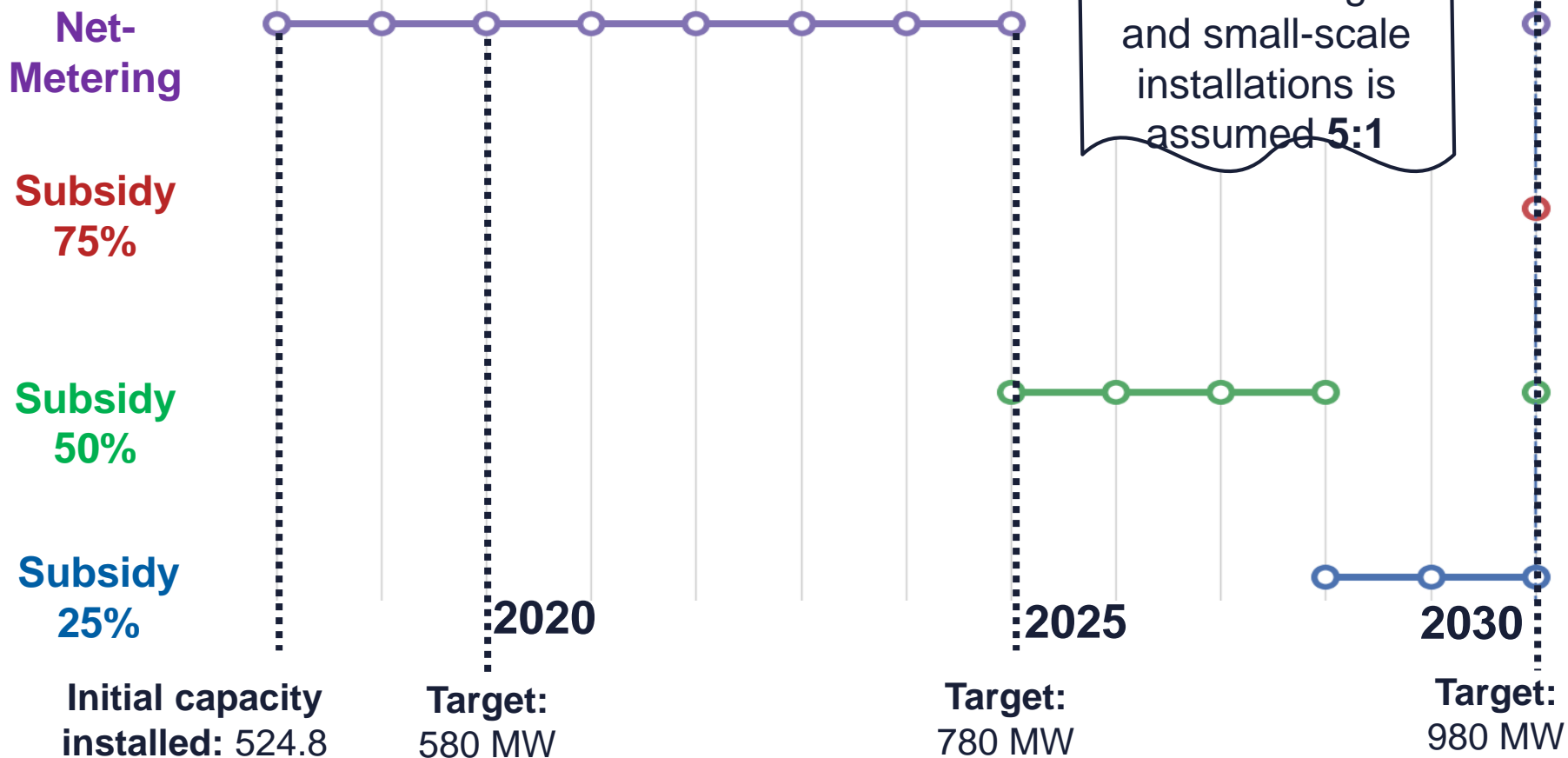
Need for Adaptive Policy Pathways...

...incorporating multiple stakeholders' perspectives into modelling scenarios

...visualizing policy adaptation maps, showing alternative pathways leading to desired policy outcomes

NEED FOR ADAPTIVE POLICY PATHWAYS... (3 / 3)

An example...



FOR MORE INFORMATION...

TEESLab, the energy modelling, strategy and policy analysis laboratory of University of Piraeus (UNIPi).

Find more about us..

Visit our Website:

<https://teeslab.unipi.gr/>

Contact us by e-mail:

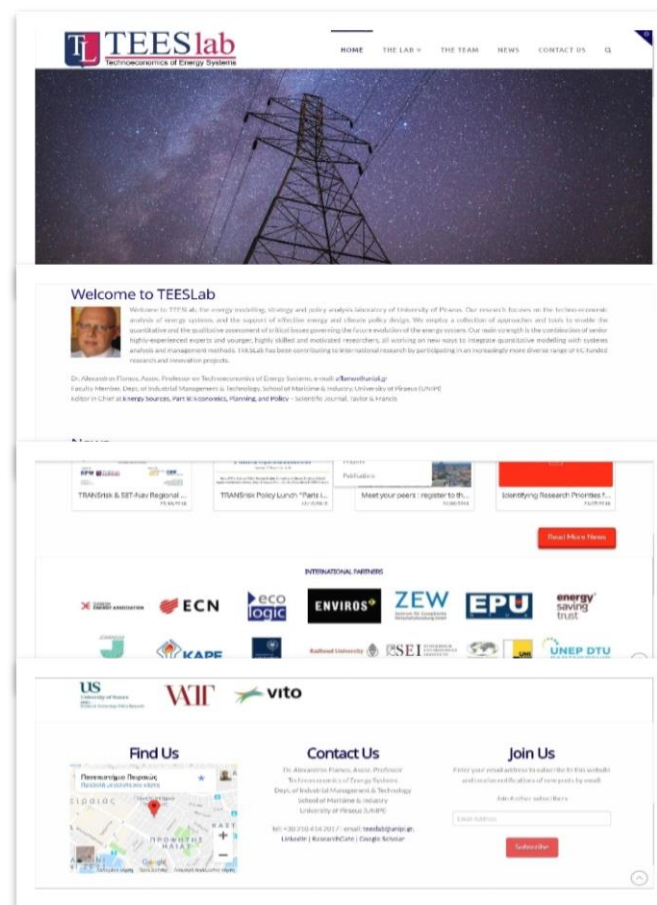


teeslab@unipi.gr

Find us in LinkedIn:



www.linkedin.com/groups/12070918/



Vassilis Stavrakas, vasta@unipi.gr

Serafeim Michas, michas@unipi.gr

Niki-Artemis Spyridaki, nartemis@unipi.gr

Sotiris Papadelis, sotpapa@unipi.gr

Alexandros Flamos, aflamos@unipi.gr

It's all about TEEMwork !

Thank you !