



A Review on the Coherence of the Strategies for Optimizing Photovoltaic Systems

Santiago Valencia, Dalarna University svg@du.se

August, 2024

DALARNA UNIVERSITY







Why research on optimizing photovoltaic systems?

"Environment sustainability"

"Decarbonization of the energy system"

"Paris climate agreement"

"Reduction of dependence on fossil fuels"

"Low-carbon energy"

"Greenhouse gas emissions"

"Climate change"

"Environmental issues"

"Carbon emissions"

"Global warming"

"Zero emission building"

"GHG emissions reduction"

"CO₂ emission"

"Decarbonise cities"

"Minimize carbon dioxide emissions"

"Environmental pollution"

"Unsustainable climate situation"



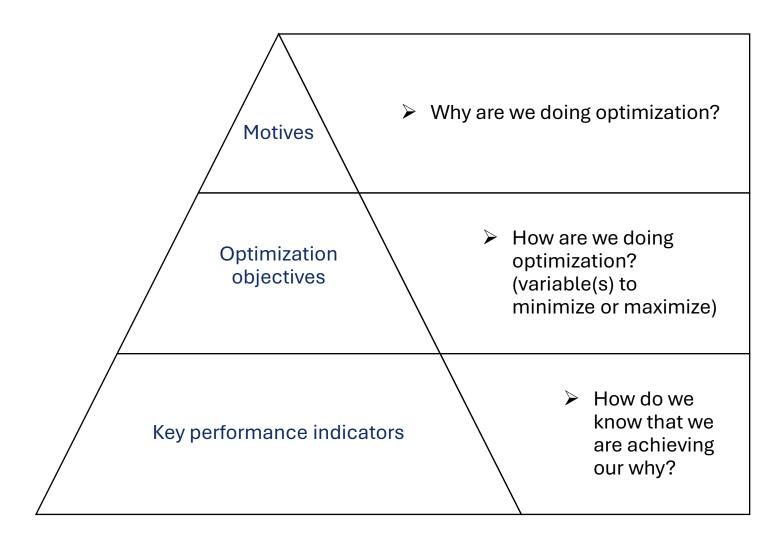


Optimization framework...





Strategic framework for optimization



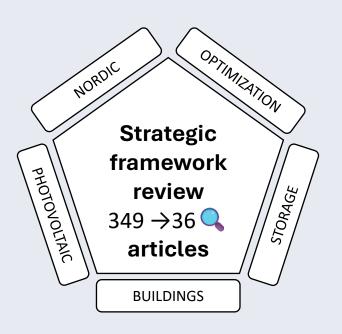






Strategic frameworks being used?

We analysed them...



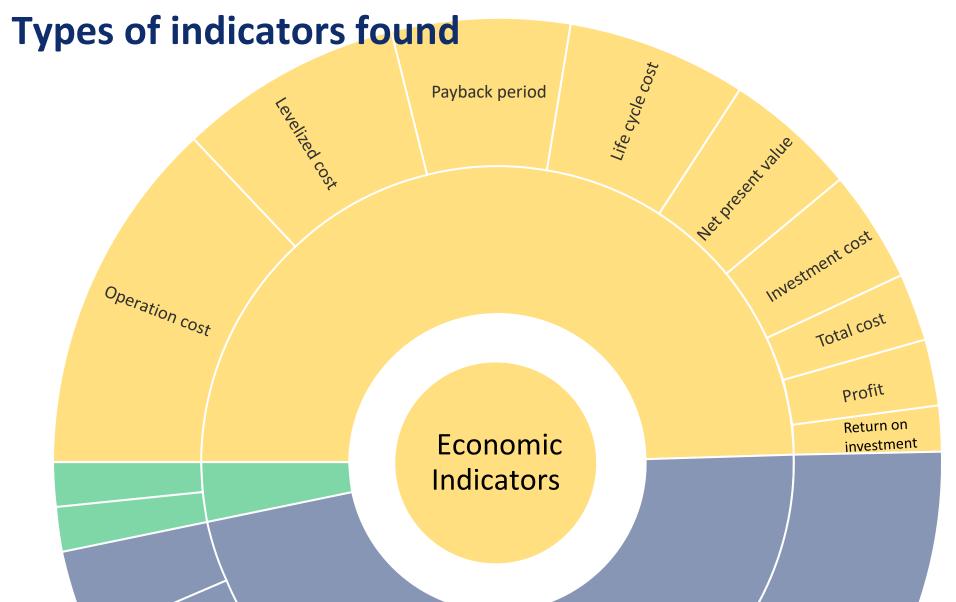


Types of indicators found Total GHG... Environmental Payback period **Economic** Life cycle cost Return on..



DALARNA UNIVERSITY







Types of indicators found Self-consumption Self-sufficiency Others Technical Indicators DALARNA UNIVERSITY



Indicators found

Environmental impact during operation only!

Total GHG emissions, operation

GHG emissions per unit of energy, operation.

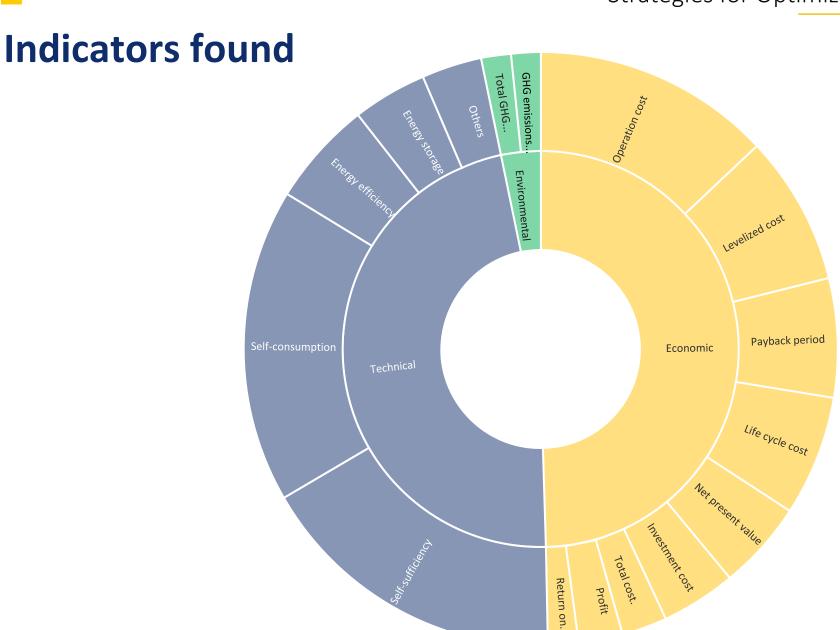
Environment al Indicators

Material extraction and manufacturing?

End of life?







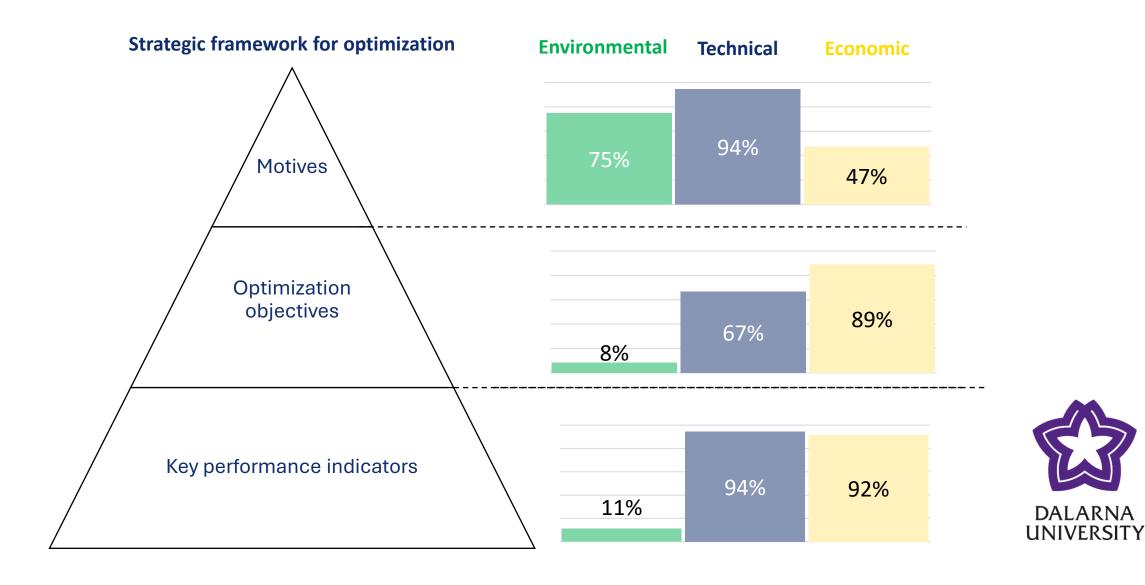




Indicators found Total GHG... Environmental Env Payback period Economic Tech Econ Life cycle cost Return on..











This makes me wonder...







Most articles show environmental motives...

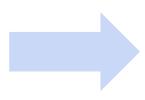


Only a few aim to improve or quantify them directly.



Yes, so, what is next?

More comprehensive and coherent studies for optimizing PV systems.



What happens with the environmental indicators if we optimize only for technical and/or economic objectives?

Life cycle approach for the optimization with environmental variables. ••



What happens with the lifecycle environmental indicators if we optimize only considering the operation emissions?







Thank you!

Santiago Valencia (svg@du.se)

SOLELFORSKNINGS CENTRUM SVERIGE