

ECONOMICS OF ENERGY STORAGE - ECOENESTO

TASK 41

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TASK MANAGER

Germany acting through:

BVES - Energy Storage Systems Association
Andreas Hauer, Beatrice Schulz



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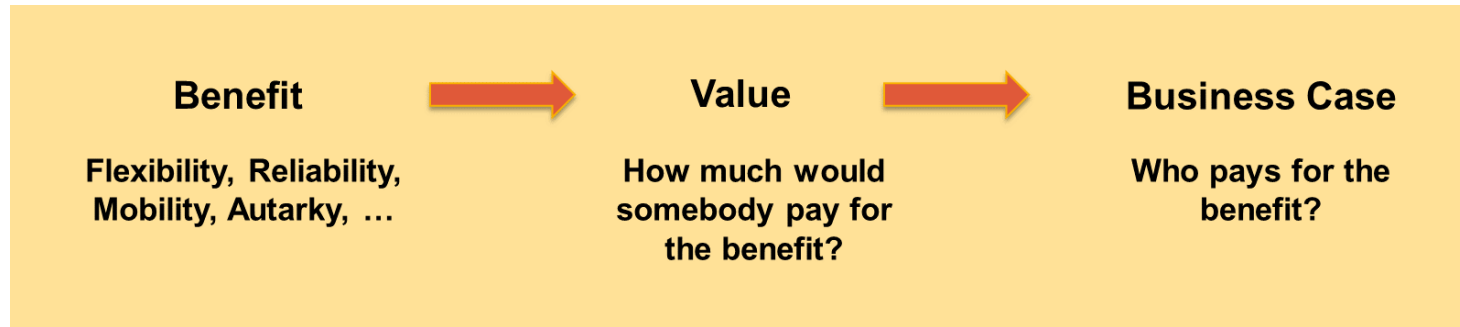
on the basis of a decision
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GOAL

Contributing to a better understanding of ...

...how a certain **value** is created from a certain **benefit** of an energy storage technology or system and

...how this can be translated into a **business case** in a systematic way



SCOPE

All energy storage technologies

- Electrical
- Thermal
- Chemical

All relevant energy storage applications in the energy system

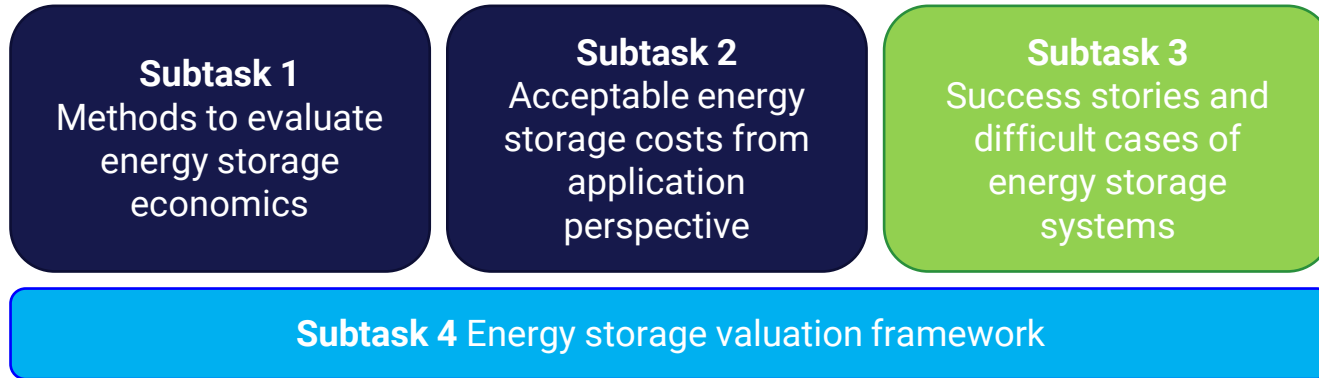
- Centralized, decentralized
- All sectors
 - Electricity
 - Heating, cooling
 - Mobility



OBJECTIVES

- Collection of **methods to evaluate the economic viability** of energy storage systems
- **Definition of KPIs** to evaluate the energy storage economics
- Inventory of **economically interesting energy storage configurations**
- Inventory of “**difficult cases**” **without a business case**
- **Comparison of energy storage configurations** to solutions with **other flexibility measures**
- Analysis of the influence of **regulatory framework conditions**

SUBTASKS



SUBTASKS

Subtask 1

Methods to evaluate energy storage economics

Subtask 2

Acceptable energy storage costs from application perspective

Subtask 3

Success stories and difficult cases of energy storage systems

Subtask 4

Energy storage valuation framework

What is to be done?	Subtask Lead
Collect and classify methods to evaluate storage economics	KTH, Sweden Felipe Gallardo
Extend top-down approach to all types of energy storage (both capacity and power)	ZAE, Germany Christoph Rathgeber
Collect and analyse economically viable and non-viable examples	DTU, Denmark Jianhua Fan
Elaborate a method to develop business cases for energy storage systems	TNO, The Netherlands Joris Koornneef

SUBTASK 1: METHODS TO EVALUATE ENERGY STORAGE ECONOMICS

Objectives:

- Identify and systemize available methodological approaches to evaluate the economic efficiency of energy storage
- Propose a set of guidelines for the assessment of energy storage economics.

Deliverables:

- Chapter for final Task report: Guidelines, methods, and KPIs to evaluate energy storage economics
- Paper: Methods and KPIs to evaluate energy storage economics

Methodology for financial-economic performance assessment of ES

Technical definition of the storage solution

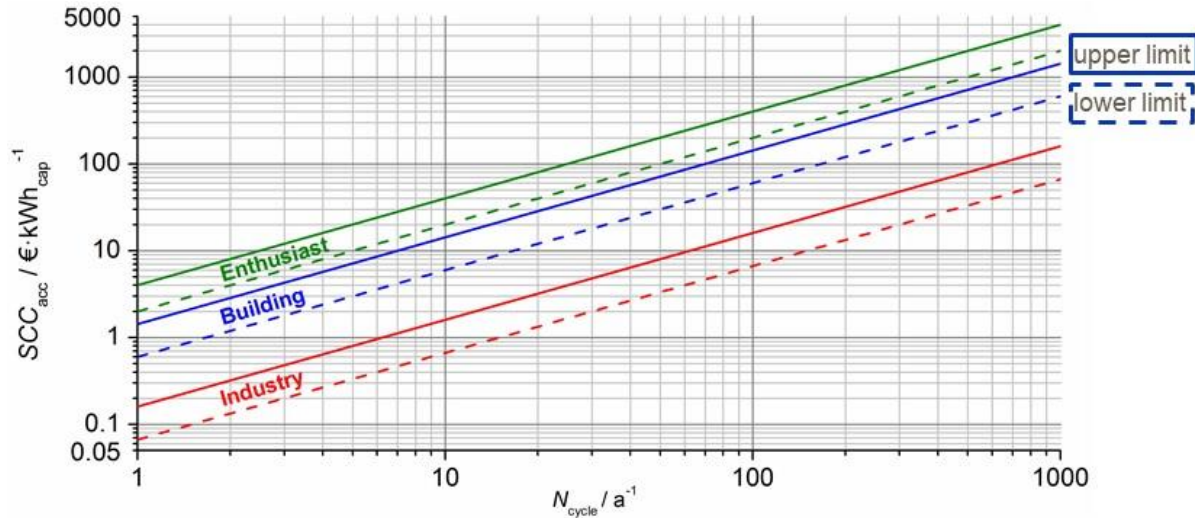
Cost and financial input definition

Economic criteria goal definition

Economic assessment

Decision-making criteria

SUBTASK 2: ACCEPTABLE ENERGY STORAGE COSTS FROM APPLICATION PERSPECTIVE



Objectives:

- Extend existing maximum acceptable energy storage costs approach to electrical and chemical energy storage systems
- Develop a method to calculate maximum acceptable costs of other benefits (e.g. charging/discharging power, flexibility, autarky)

Deliverable:

Paper on extended maximum acceptable energy storage costs approach

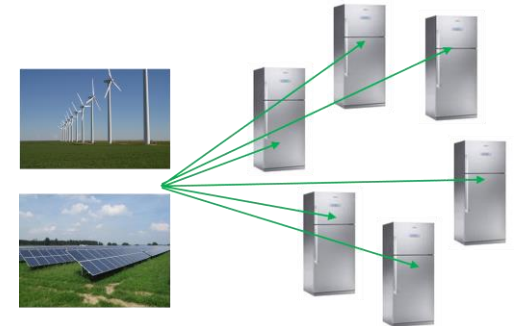
SUBTASK 3: SUCCESS STORIES AND DIFFICULT CASES OF ENERGY STORAGE SYSTEMS

Objectives:

- Identification of success stories for different ES technologies and applications
- Investigation of economic viability with methods of Subtask 1
- Selection of KPIs from Subtasks 1 and 2
- Recommendation of suitable evaluation methods and KPIs
- Identification of difficult cases, preparation of a not-to-do list

Deliverables:

- Expert network and expert questionnaires
- Report of international literature and market review
- List of success stories and difficult cases



SUBTASK 4: ENERGY STORAGE VALUATION FRAMEWORK

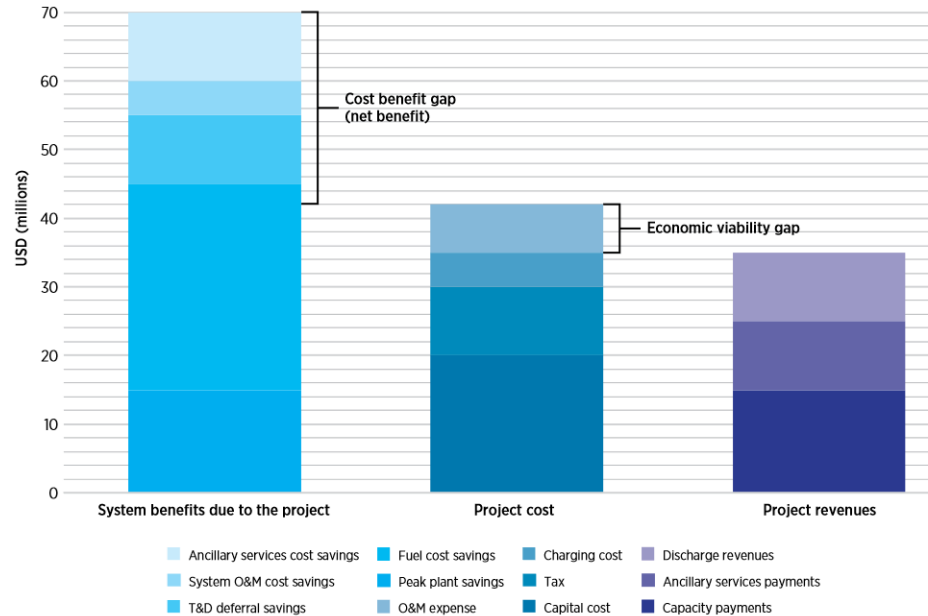
Objectives:

- Develop an energy storage valuation framework as a stepwise approach to build a sustainable business case for energy storage projects from public and private sector perspective
- Identify innovative business models with a focus on stacking business revenues by service or application stacking

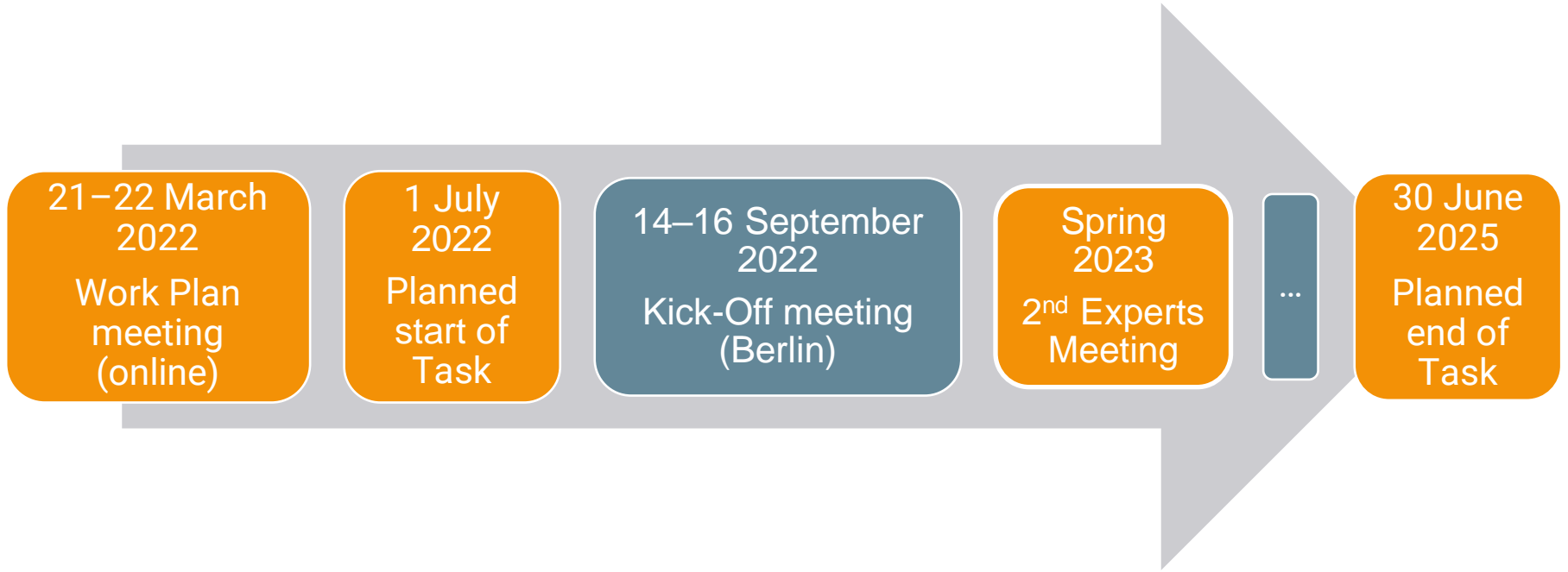
Deliverables:

- Handbook on Energy storage valuation framework in different geographical and market settings
- Paper on innovative business models (provisional)

IRENA's Electricity Storage Valuation Framework



TIMELINE



SCHEDULE OF ACTIVITIES

Phase 1: Collection and review of existing knowledge and methods	Phase 2: Working on main objectives	Phase 3: Test of methods and dissemination via workshops
July 2022 – June 2023	January 2023 – June 2024	July 2024 – June 2025
<ul style="list-style-type: none">existing (calculation) methods to evaluate energy storage economicsKPIs to techno-economically assess energy storagesuccess stories and difficult cases of energy storage projects and installationsexamples of valuation frameworks	<ul style="list-style-type: none">conduct surveys regarding current methods and KPIs and future trends to assess energy storage economicsextension of the maximum acceptable storage capacity costs approachstudy success stories and difficult cases of energy storage systemsdevelop energy storage valuation framework covering all technologies and applications	<ul style="list-style-type: none">assess energy storage case studies with promising methods & KPIs and developed valuation frameworkworkshops with stakeholders of energy storage technologies and applicationsresults of EcoEneSto are tested and made available to the public

EXPECTED RESULTS

- Collection of methods to evaluate the economic viability of energy storage systems
- Set of recommended KPIs to benchmark energy storage economics
- List of economically interesting energy storage solutions from participating countries
- Framework to derive business cases from technical benefits and economic value of energy storage systems



THANK YOU FOR YOUR ATTENTION!

Thanks to the support of:

Supported by:



Federal Ministry
for Economic Affairs
and Climate Action

on the basis of a decision
by the German Bundestag

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