Making the BESSt out of green energy

Drake Consulting

Driving grid stability and profitability through smarter storage and circular innovation

Executive Summary

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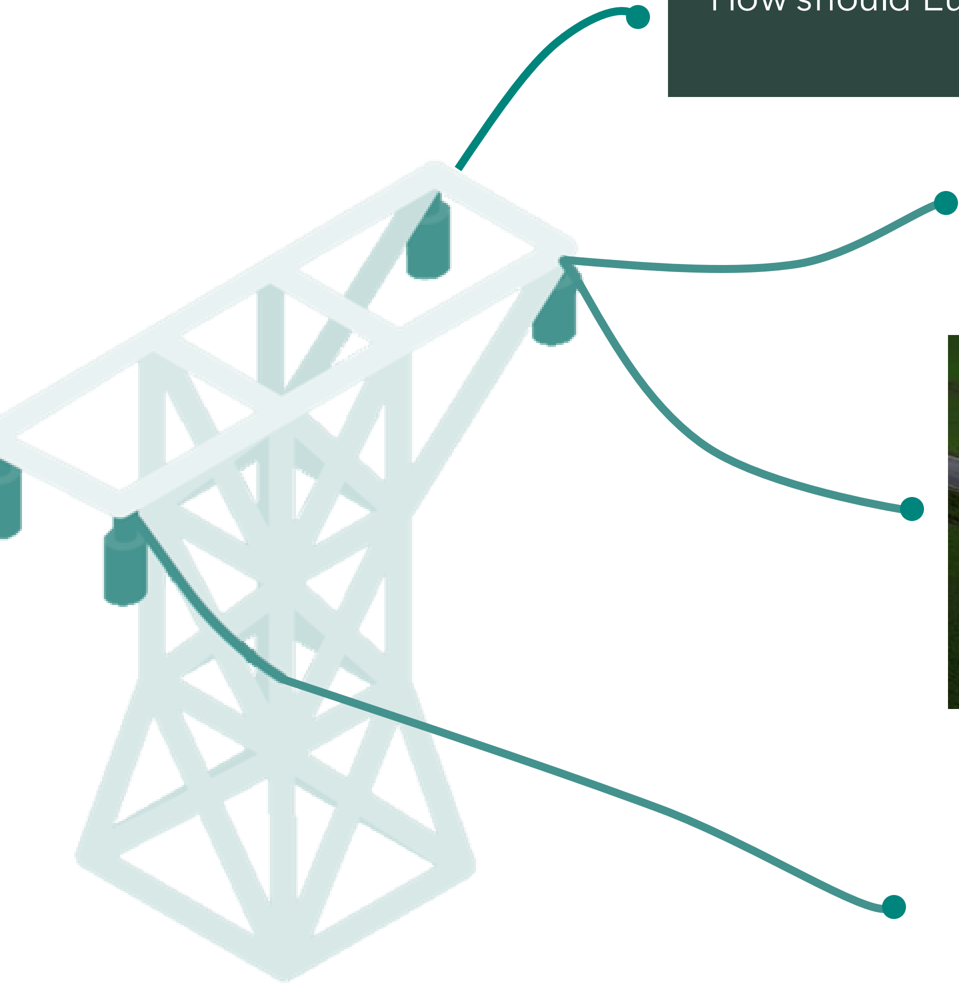

How should European Energy expand its presence in the BESS market in 2026–2028, creating long-term value while managing risk and capital limitations?

Analysis:

1 **Situation Analysis**
Market volatility, limited capital, need for profitability

2 **Market Expansion Analysis**
Country prioritization, contract mix, innovation roadmap

330	**5**	**3.08**	**77%**
Million Euros in Annual Revenue	Key Projects	GW of Power Deployed	Retrofitting Projects

European Energy must address these key principles to ensure effective BESS deployment

Situation Analysis

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Market Portfolios

1. Mature Markets have existing infrastructure and can be leveraged through experience

2. Emerging Markets have a higher growth potential with an estimate **40% CAGR** within the green energy market *(Source: World Bank)*

Takeaway

European Energy needs to find a **balance** of **mature** and **emerging** markets to expand into

Profitability

1. Cost Constraint of **€300M** budget for BESS expansion

2. Decrease of **67%** in European Energy profit between 2023 – 2024 with expectation to drop further given worsened duck curve *(Source: Annual Report)*

Takeaway

Moving forward, European Energy needs a way to **grow** while **remaining profitable**

Market Volatility

1. Demand is lowered due to suboptimal BESS positioning

2. Increased Supply during the day decreases prices below the breakeven point

"The duck curve drives midday power prices down and evening prices up"
(Source: European Energy)

Takeaway

Stabilizing the grid through BESS construction should be done in **high energy demand areas**

Circular Economy

1. Need for Innovation: *"Find ways to capture additional business value through innovation of the business model"* *(Source: European Energy)*

2. Achieve circular economy: European Energy needs to *"build front position on circularity"* *(Source: European Energy)*

Takeaway

European Energy needs to **scale** a novel **circular economy** quickly

European Energy's BESS investment should focus only on tolling offtake agreements

Market Analysis

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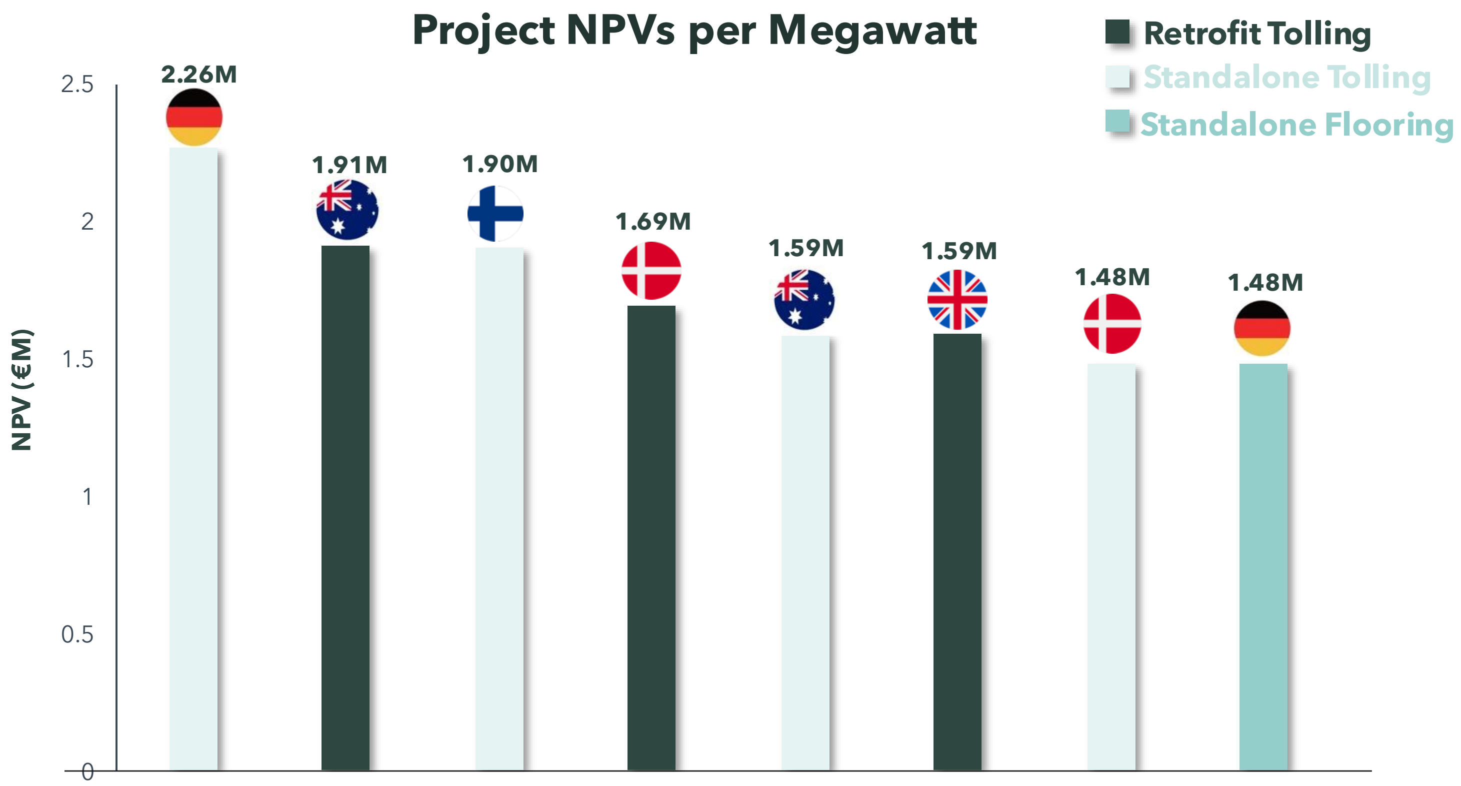

The graph shows the eight highest NPV per MW projects out of all countries, offtake agreements and BESS types

Calculation = Present Value of Annual Revenue Stream – Present Value of Annual OpEx – CapEx

Key Takeaways

Offtake Agreement

When evaluating the **highest NPV projects**, the tolling offtake agreement is used throughout the top 7

Based on this data, it is clear European Energy should **strictly pursue tolling** offtake agreements to **increase profitability**

Key Countries

After evaluating all 10 proposed countries, **Germany, Australia, and Denmark** appear to be the countries that have the **highest NPV** investments with each country having two **different** projects within the top 8

Australia, Denmark, and Germany are key markets for 2026-2028 BESS investment

Market Analysis

High NPV Countries	Top 8 NPV/MW	Energy Capabilities	Market Competition	Regulatory Compliance
Australia	€3.50M	1500MW	Medium	Medium
United Kingdom	€1.59M	1000MW	High	High
Denmark	€3.17M	900MW	Low	Low
Finland	€1.90M	200MW	High	Medium
Germany	€3.74M	1000MW	High	High

Standalone vs Retrofit

Based on the key metrics above, **Australia, Denmark and Germany** show the best opportunities for expansion

Key Principles addressed:

Market Portfolio

Profitability

Volatility

Project BESSt

1
Smart Grid Expansion

Build standalone and retrofit BESS near AI data centres and renewables to stabilize high-load grids

2
Circular Battery Loop

Recycle EV and old BESS batteries into second-life systems to cut costs, reduce emissions, and secure long-term material supply

Project BESSt

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Smart Grid Expansion

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Circular Battery Loop

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European Energy poised to lead BESS demand near AI-powered grids

Solution 1: Smart Grid Expansion

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Guiding question:

Where should European Energy build BESS to **stabilize high-load grids** and **meet 24/7** clean-energy demand?

An exciting new market: AI data centers

1. Global data-centre electricity use will **more than double** by 2030
   (Source: IEA)
2. Frankfurt's data centres alone consume **~40%** of local electricity
   (Source: McKinsey)
3. Most AI data centres **lack on-site generation**, relying entirely on strained local grids
4. Microsoft, Google, Amazon, and Meta all target **24/7 carbon-free energy** for their AI infrastructure

7.2% CAGR
2026-2030

Why ***standalone BESS*** near AI data centres?

Standalone batteries near high-demand clusters stabilize the grid and **maintain 24/7 reliability**

Ideal for data centres without on-site generation, ensuring **consistent** power and **reduced** grid stress

Why ***retrofit BESS*** near solar and wind farms?

Overcome duck curve loss

Leverage off existing infrastructure

Provide grid stability

Key Principles addressed:

Market Portfolio | Profitability | Volatility | Circular Economy

European Energy can maximize the utilization of their BESS through a clear go-to-market strategy

Solution 1: Go-to-market strategy

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2026 Phase 1:

1 **Identify & target high-load nodes**

Pinpoint substations near AI data-centre clusters and renewable hubs with major grid congestion in Germany, Denmark, and Australia

2 **Partner with TSOs / DSOs for pilot projects**

Launch multi-site pilots per country co-developed with grid operators to provide balancing, peak-shaving, and congestion relief

R: Slow partner buy-in or regulatory delays

M: Engage early with grid operators through joint feasibility studies and align with national storage targets

2027 Phase 2:

R: Underperformance of pilots or technical integration issues

M: Start with small-scale modular units (10–20 MW) and monitor KPIs jointly with grid operators to refine performance

1 **Execution: pilot and proof of impact**

Deploy multi-site BESS pilots in each country to deliver balancing, peak-shaving, and congestion-relief services

2028-29 Phase 3:

1 **Scaling through visibility and replication**

Publicize operational success through energy conferences, media, and policy networks and use performance data to replicate standardized "grid-support storage" contracts

R: Limited visibility or policy traction

M: Leverage case studies and cost-saving evidence to lobby ministries and investor forums; publish verified impact metrics

Key Takeaway

European Energy scales by proving grid value first. Partnerships, performance, and policy drive adoption faster than marketing

Key Principles addressed:

Market Portfolio | Profitability | Volatility | Circular Economy

Expanding into high-growth, grid-constrained markets fueled by renewables and AI demand

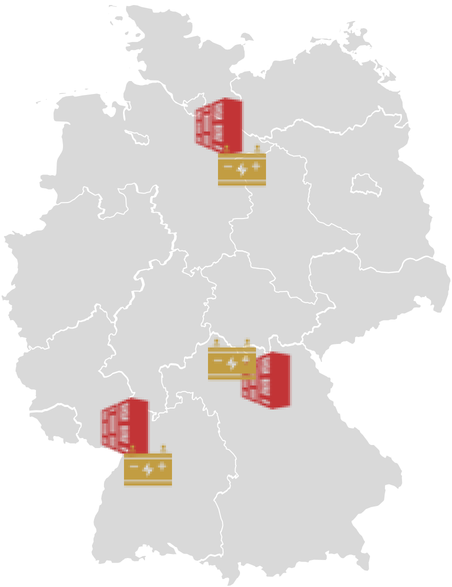
Solution 1: Smart Grid Expansion

- Data Centre
- Standalone
- Retrofit

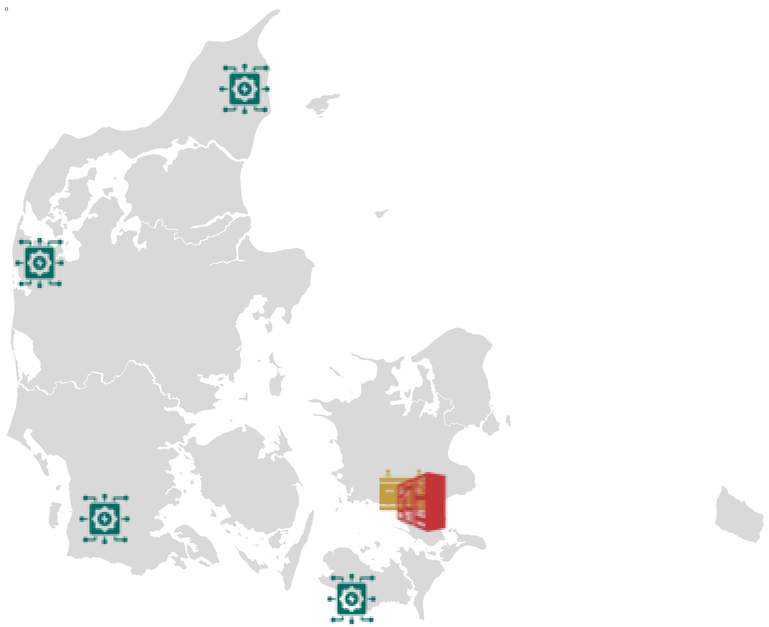
Strategic Deployment Focus

Prioritizing standalone builds near data-centre grids and retrofits near renewables to **maximize grid stability and profitability**. Targeting data-centre corridors and renewable hubs across key markets for optimal grid impact

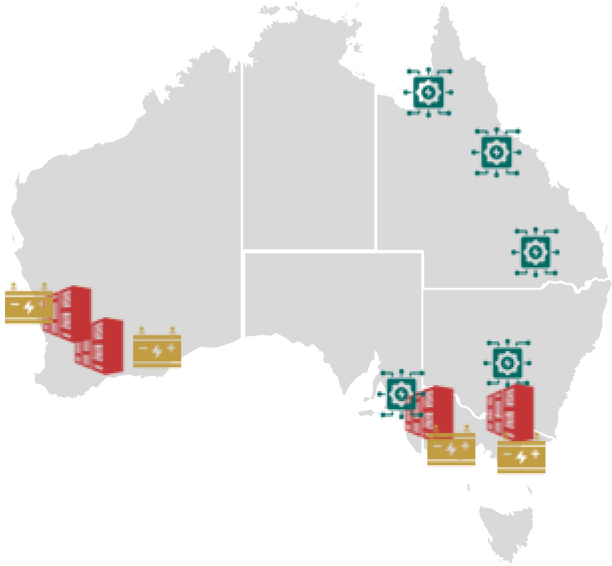
Germany



Denmark



Australia



Project BESSt

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Smart Grid Expansion

Build standalone and retrofit BESS near AI data centres and renewables to stabilize high-load grids

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Circular Battery Loop

Recycle EV and old BESS batteries into second-life systems to cut costs, reduce emissions, and secure long-term material supply

Project BESSt

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Smart Grid Expansion

Build standalone and retrofit BESS near AI data centres and renewables to stabilize high-load grids

2

Circular Battery Loop

Recycle EV and old BESS batteries into second-life systems to cut costs, reduce emissions, and secure long-term material supply

Through recycling batteries, European Energy can cut CapEx, emissions, and secure long-term sustainable supply for BESS expansions

Solution 2: Circular Battery Loop

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Lithium Battery Recycling is a circular battery ecosystem that recycle EV batteries and old BESS units to create new BESS

Old EV batteries — Old BESS batteries — Recycle old batteries — New BESS batteries!

Why battery recycling?

Achieve a **circular economy** and address **sustainability** by reusing valuable resources

Decrease in battery life span after being recycled

1. Cost Savings

Decreased lifespan is outweighed by increase in cost savings

Second-life modules can cost **<60%** of equivalent new battery packs *(Source: McKinsey)*

2. Faster Production

Decrease time to deploy while maintaining efficacy

20% decrease in time to deploy *(Source: PwC)*

3. Sustainability

Align with company value:
"Become the global **leader** in the **green transition**" *(EE vision statement)*

Recycling lithium-ion batteries can yield **~72-88%** less water use, **~77-89%** less energy compared to mining virgin materials *(Source: Stanford University)*

4. Overcome Natural Resource Shortage

Address shortage of key materials used in battery production

Global supply will fall about **50%** short of demand by **2030** *(Source: International Energy Agency)*

European Energy can work with existing battery recycling companies to replenish their BESS sustainably

Solution 2: Circular Battery Loop

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How does it work?

European Energy use renewed EV packs from automakers, use them in stationary BESS, and recycle them for metal recovery

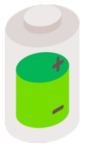
Step 1:
Locate **TWO** types of vendors to:

1. Purchase old batteries
2. Rebuild new BESS

1. Automobile companies
To purchase old EVs

Potential Automobile Vendors:
The Volvo Group
Renault

2. Battery recycling companies
To rebuild old batteries into new BESS



Potential EV Recycling Vendors:
The Volvo Group
NorthVolt, Connected Energy:
European based company, strong record of EV battery recycling and expertise in BESS recycling

Step 2:
European Energy will sign framework agreements with partners to secure supply, follow compliance, and have quality and safety controls

Highest Potential Vendor

1 ***The Volvo Group****, an automotive manufacturing company that* ***supplies*** *and* ***recycles*** *old EV batteries*

- *Large market share of EV in* ***Europe***
- *Provides* ***battery passport*** *&* ***battery history*** *(required for EV reproduction by law)*

VOLVO

Recycling batteries allows European Energy to establish a successful circular economy through business model innovation and proven success

Solution 2: Circular Battery Loop

Purchase/bring in recycled EVs/BESS: **The Volvo Group**

Rebuild recycled batteries: **The Volvo Group**

New BEES: **European Energy**

Old EV batteries — Old BESS batteries → Recycle old batteries → New BESS batteries!

We know this solution will work because…

Case Study — Aeroporti di Roma

Rome Airport's partnership with ENEL used government funding to build recycled EV BESS as a backup energy storage systems. With proven strategies used within the European market, European Energy can model after similar projects

Case Study — REDWOOD MATERIALS

Redwood Materials was able to leverage nearby data centers to ensure a successful use of recycled EV batteries provided from General Motors. With it being the second largest second-life battery deployment, European Energy has an opportunity to set a new global standard for battery recycling with proven success to model after

Key Principles addressed:

Market Portfolio — Profitability — Volatility — Circular Economy

European Energy can rely on recycled EV and BESS batteries given their proven success in diverse markets

European Energy should start tomorrow on identifying sites and securing partnerships

Solution Summary

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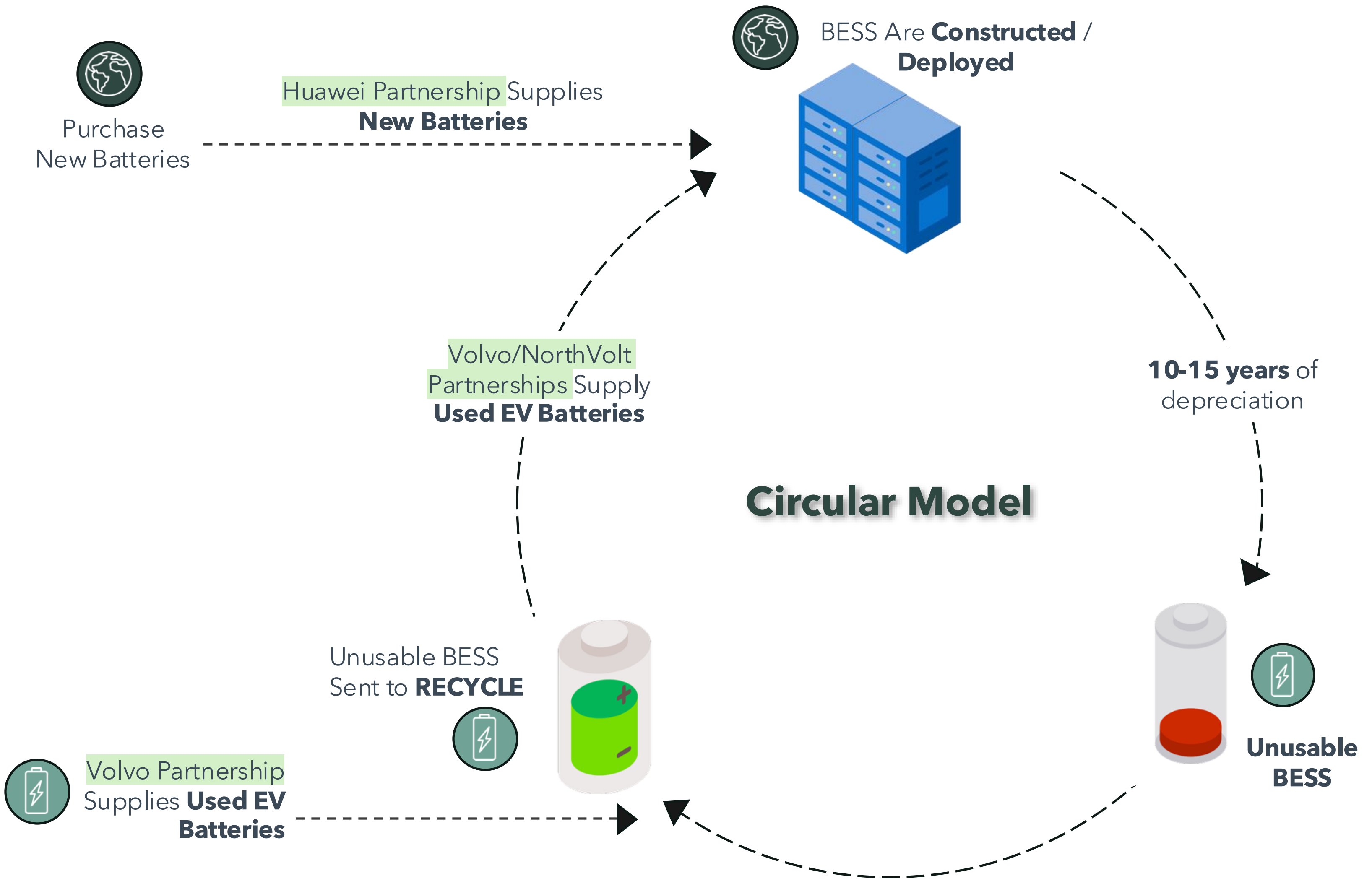
Recap of project BESSt



Legend

- **Solution 1** (Smart grid expansion)
- **Solution 2** (Circular battery loop)
- **Highlight** — **Vendor Partnerships**

Tomorrow's Tasks

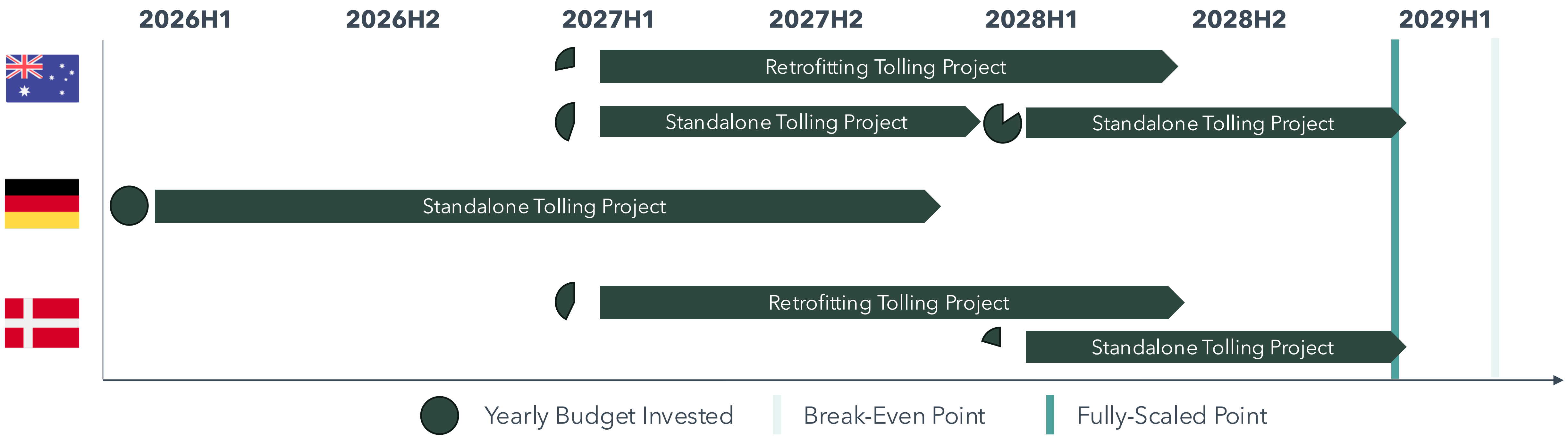
1. Identify sites near existing projects and grid-powered AI data centres
2. Contact DSO&TSO to inform them of addition to local grid supply
3. Contact new and old battery supply companies as well as recycling companies to aid with faster integration (ex. Volvo Group)

Key Principles addressed:

Market Portfolio | Profitability | Volatility | Circular Economy

European Energy will utilize their €300 Million budget on projects by 2029

Implementation Timeline



Risks and Mitigations

Most Severe ↑ … ↓ Least Severe

1	Limited Value-Chain Ownership	Maintain operational agility, allowing to capture margins, improve responsiveness, and competitive positioning
2	Higher WACC from Elevated Debt Levels	Utilize high-performing assets as collateral to negotiate more favorable financing terms and optimize capital structure
3	Issues on Divesting New Projects	Adopt a merchant ownership model to monetize assets more effectively and diversify revenue streams

European Energy deploys over 3.08 GW of power and earns €612.72M by 2030

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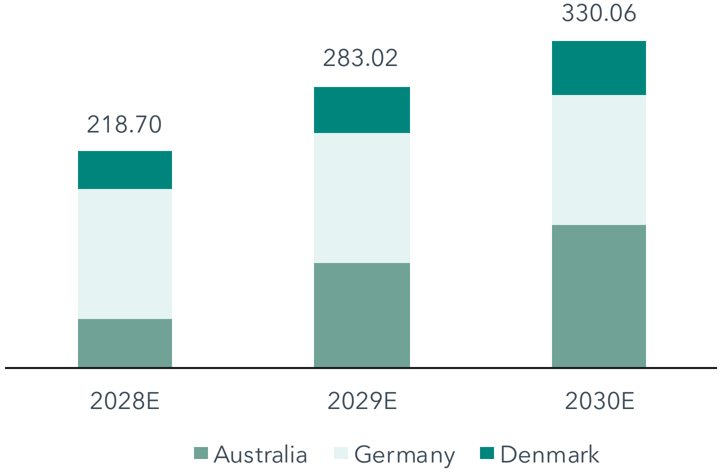
Financial Impact

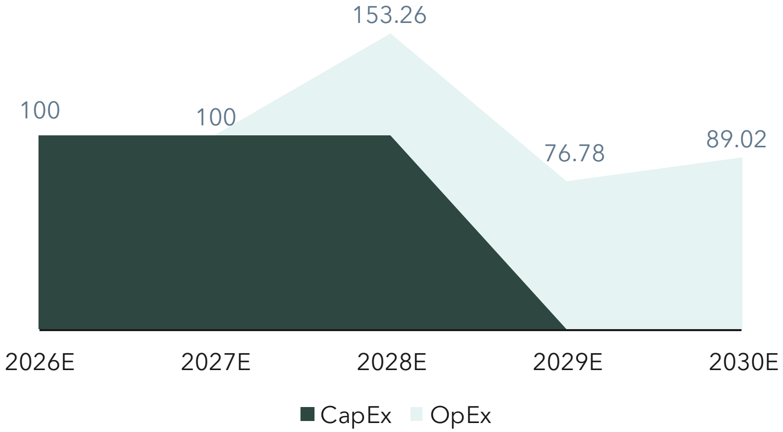
Incremental Revenue

(in millions €)



Costs

(in millions €)

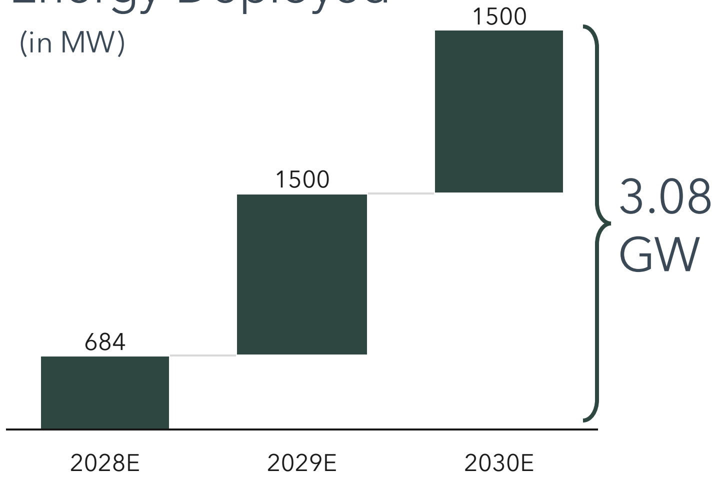


Key Assumptions

1. First revenue generated in 2029, due to 2-year development period
2. Focusing on highest NPV per Megawatt projects
3. Project revenue decreases 2% per year, while WACC remains constant

Energy Deployed

(in MW)



Key Statistics

Retrofitting
vs
Standalone

Growth
vs
Mature

Net Present Value (NPV)

2 Projects – €2.42 Billion

1 Projects – €2.26 Billion

2 Projects – €950.67 Million

Project BESSt directly addresses European Energy's core strategic challenges

Overall Summary

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Challenge

European Energy needs to find a **balance** of **mature** and **emerging** markets to expand into

Smart Grid Expansion

BESSt targets **Germany, Denmark, and Australia**, balancing mature infrastructure with high-growth renewable regions

Challenge

Moving forward, European Energy needs a way to **grow** while **remaining profitable**

Circular Battery Loop

Second-life EV battery reuse **reduces CapEx by ≈ 30%, shortens** deployment time, and **lowers** WACC

Challenge

Stabilizing the grid through BESS construction should be done in **high energy demand areas**

Smart Grid Expansion

Standalone BESS placed near AI data centres and retrofit sites **smooth** daily load variations and **reduce** price volatility

Challenge

European Energy needs to **scale** a novel **circular economy** quickly

Circular Battery Loop

Creates **closed-loop ecosystem** via Volvo and Northvolt partnerships for battery recycling and remanufacturing

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Financial Overview

Appendix

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Energy Deployed

Revenue Projections (€ million)	2026E	2027E	2028E	2029E	2030E
Incremental Revenue	-	-	218.70	283.02	330.06
Australia	-	-	50.70	106.74	145.50
Germany	-	-	130.00	130.00	130.00
Denmark	-	-	38.00	46.28	54.56
Operating Costs	-	-	53.26	76.78	89.02
Australia	-	-	13.26	31.26	43.50
Germany	-	-	30.00	30.00	30.00
Denmark	-	-	10.00	15.52	15.52
Incremental Profit					
Australia	-	-	37.44	75.48	102.00
Germany	-	-	100.00	100.00	100.00
Denmark	-	-	28.00	30.76	39.04
Profit	0	0	165.44	206.24	241.04

Debt & Equity

Equity Schedule (€ million)	2026E	2027E	2028E
Australia	-	64.8	81.6
Germany	100.00	-	-
Denmark	-	35.20	18.40
Total	100.00	100.00	100.00

Debt Schedule (million €)	2026E	2027E	2028E
Australia	0	259.2	585.6
Germany	400	400	400
Denmark	0	140.8	214.4
Total	400	800	1200

Energy Deployed

Energy Deployed (MW)	2028E	2029E	2030E
Australia	684	1500	1500
Germany	1000	1000	1000
Denmark	400	584	584
Total	2084	3084	3084

Projects

ojects (€ million)	Annual Revenue	CAPEX	OPEX	Annual Profit	NPV	Capacity (MW)
Australia	145.50	146.40	43.50	102.00	2479.01	1500
Retrofitting - Tolling	31.50	26.40	7.50	24.00	572.72	300
Standalone - Tolling	114.00	120.00	36.00	78.00	1906.29	1200
Germany	130.00	100.00	30.00	100.00	2264.25	1000
Standalone - Tolling	130.00	100.00	30.00	100.00	2264.25	1000
Denmark	54.56	53.60	15.52	39.04	950.67	584
Retrofitting - Tolling	38.00	35.20	10.00	28.00	677.67	400
Standalone - Tolling	16.56	18.40	5.52	11.04	273.00	184

Project Sensitivity

(€ million)	Tolling		Flooring		Merchant	
	Retrofit	Standalone	Retrofit	Standalone	Retrofit	Standalone
UK	1.59	1.17	1.04	0.70	0.89	0.56
Poland	N/A	N/A	N/A	N/A	0.89	0.66
Germany	N/A	2.26	N/A	1.48	N/A	1.28
Denmark	1.69	1.48	1.11	0.93	0.96	0.78
Lithuania	N/A	N/A	N/A	N/A	1.07	0.89
Australia	1.91	1.59	1.27	1.01	1.11	0.85
Finland	N/A	1.90	N/A	1.24	N/A	1.06
Czechia	N/A	N/A	N/A	N/A	N/A	0.62
Romania	N/A	N/A	N/A	N/A	N/A	0.59
Greece	N/A	N/A	N/A	N/A	N/A	0.59