

GREEN REVOLUTION:



WINNERS AND LOSERS

Risks and opportunities in the Green Revolution:
Stranded assets vs. profit with positive impact
What sectors and managers to focus on?

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Investment Committee Member, €24bn Energy Transition Fund

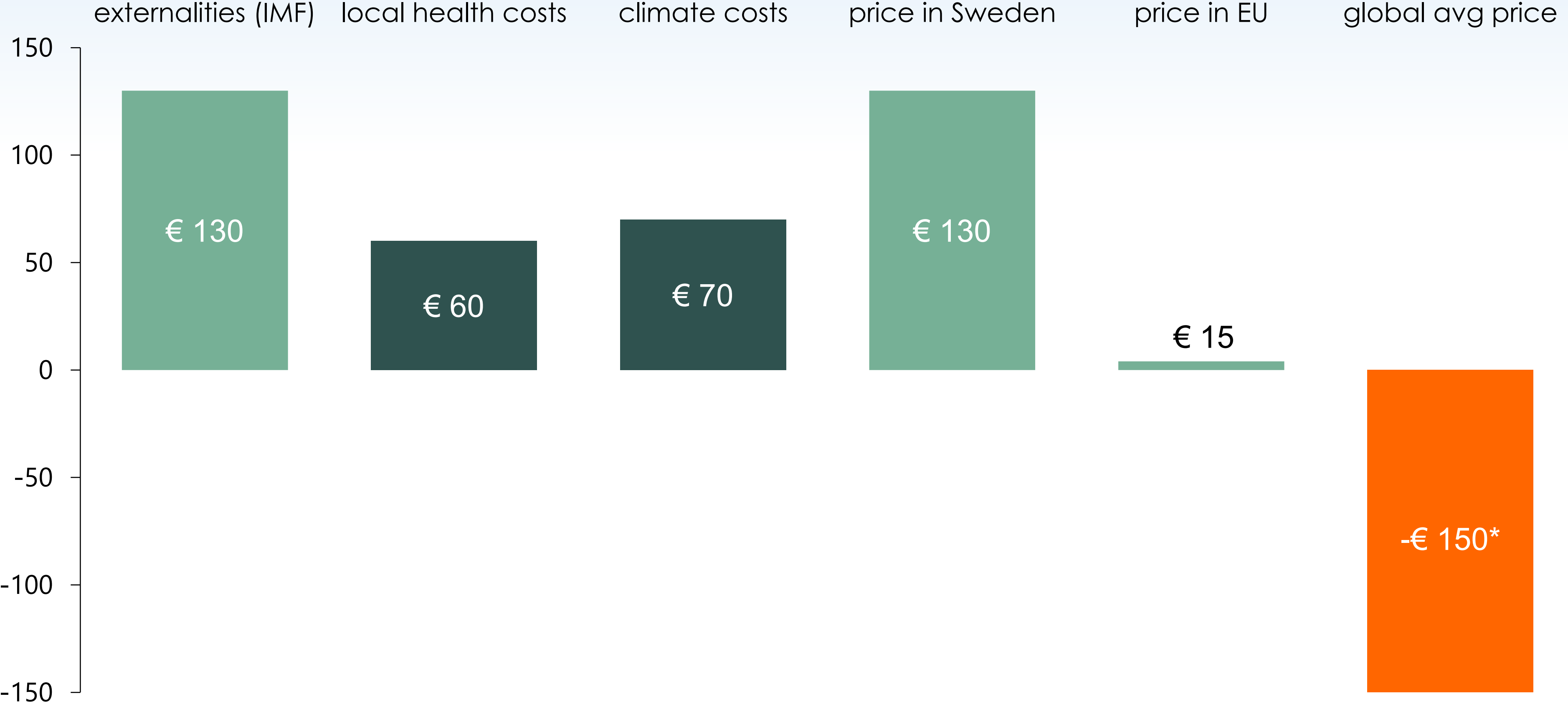
GLOBAL MEGATRENDS

- Middle class will double from 1bn-2bn in 10 years
- energy consumption will double by 2040
- megacities: 6.5bn people will live in cities of 10m-40m inhabitants by 2040
- requiring energy generation and distribution, transport, water, waste treatment and food supply
- Global GDP growing at 3% per annum, oil demand at 1% per annum
- Increased demand for healthy and clean environment
- Increased transparency due to social media et al



Carbon prices

CO₂ PRICE



* Estimate by Edenhofer

HOW BIG IS THE ANTARCTIC ICEBERG?

Larsen C compared to New York City

8 MILES



Source: www.floodmap.net, 67m water level increase (7m Greenland, 60m Antarctic)

IMPACT WILL REPLACE ESG

BP: 95% “ESG COMPLIANT” BUT NEGATIVE IMPACT

LAUDATO SI INVESTING / CONSUMER-TRANSPARENCY

=> THE NEW NORMAL IN FINANCE:

RISK, RETURN & IMPACT (EXTERNALITIES)

**INSTITUTIONAL INVESTOR GROUP ON CLIMATE CHANGE
319 INVESTORS, \$28 TRILLION UNDER MANAGEMENT
CALL ON G7 AND G20:**

ADHERE TO PARIS AGREEMENT

INTRODUCE PRICE ON CO₂ (E.G. €130/TON SWEDEN)

PHASE OUT FOSSIL FUEL SUBSIDIES AND COAL POWER

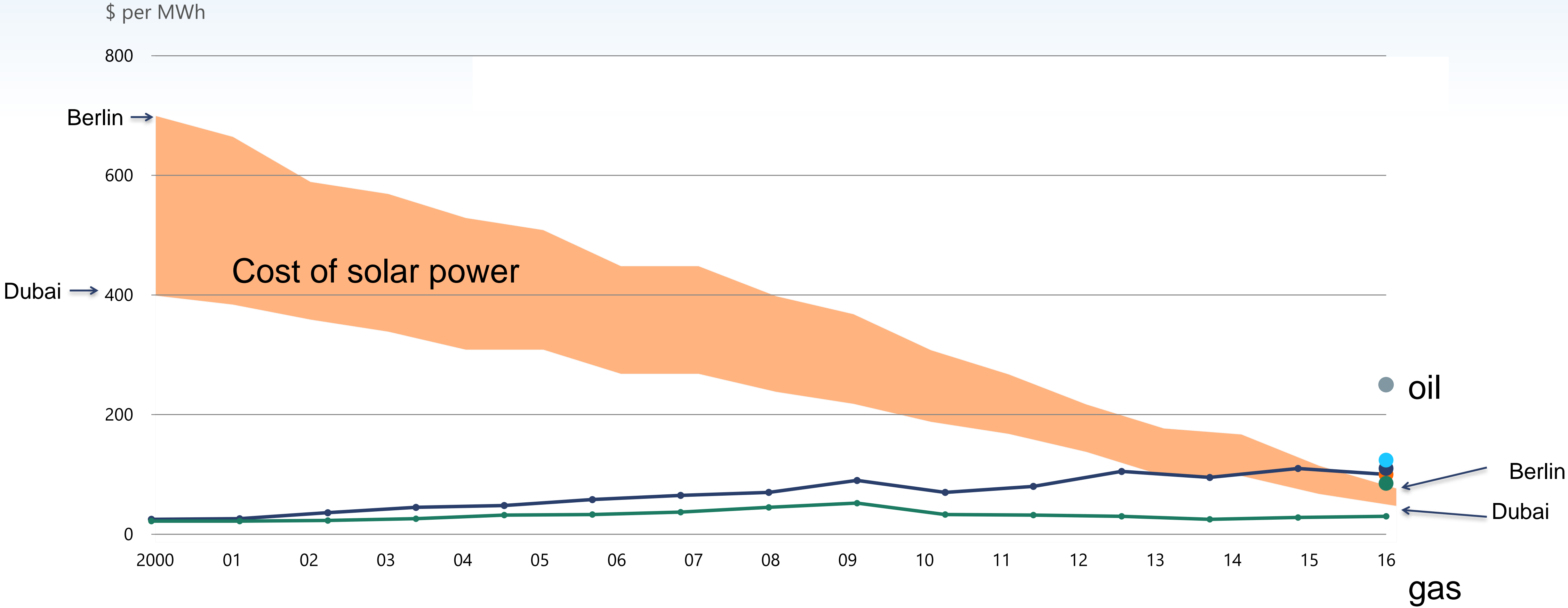
ADOPT G20'S FSB CLIMATE RISK DISCLOSURE RULES

SPACE NEEDED IN SOLAR PANELS TO POWER THE WORLD...



The elephant in the room

SOLAR < \$0.02/KWH COMPETITIVE TO \$4/BARREL OF OIL



A €20 000 ELECTRIC CAR => SAVES €1 000 PER YEAR



VEHICLE-TO-GRID => COULD EARN €1 000 A YEAR

Speed of change

=> GREEN INDUSTRIAL REVOLUTION IS UNDER WAY

1900: WHERE'S THE CAR?

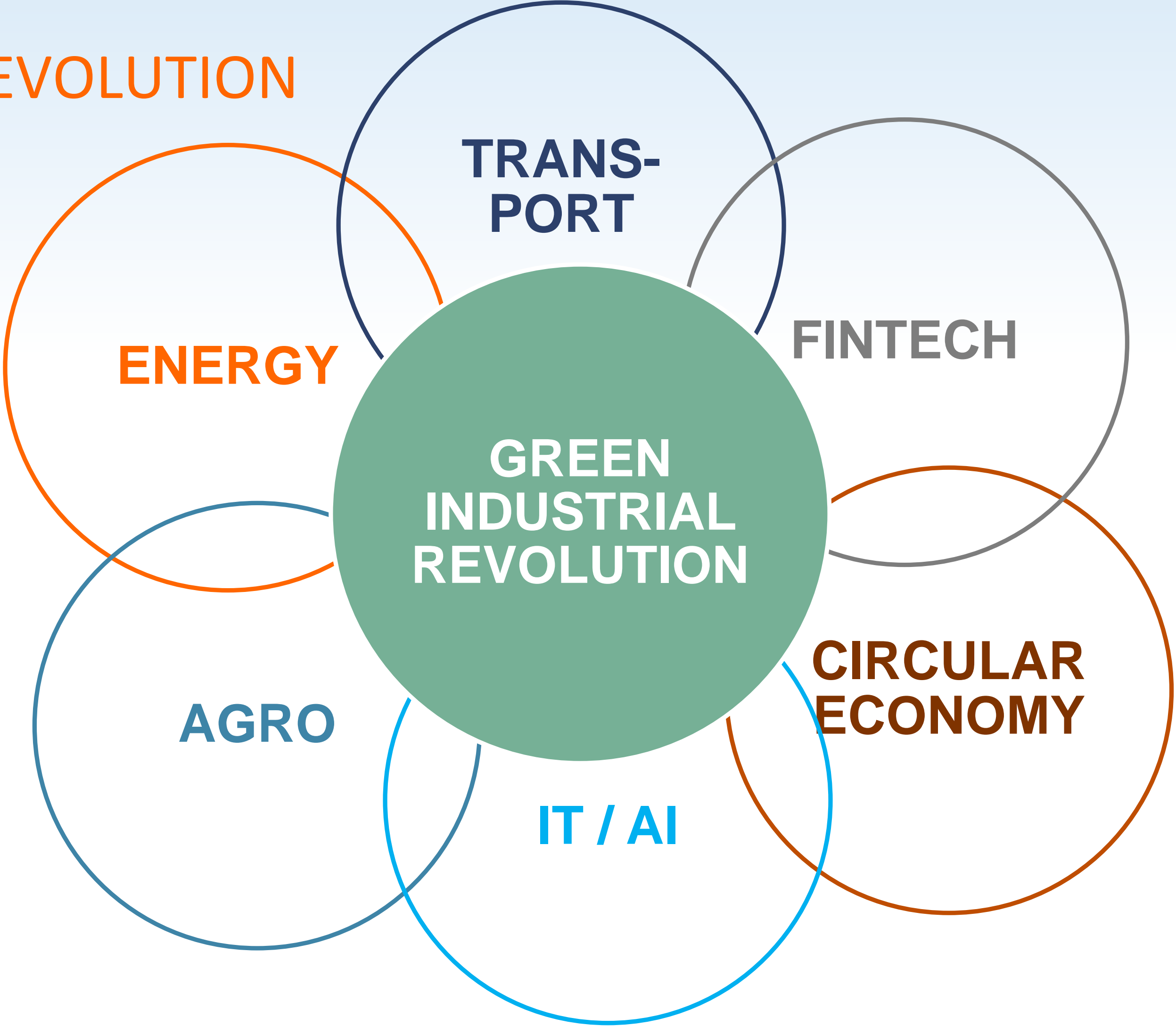


1913: WHERE'S THE HORSE?



Source: Rocky Mountain Institute

THE GREEN REVOLUTION



=> RESOURCE EFFICIENCY, INNOVATION, JOBS & GROWTH

INVESTMENT STRATEGY

ADDRESSABLE MARKETS 2017-2025



Investment Criteria

- ▶ typically > €5m revenues
- ▶ EBITDA on path to profitability
- ▶ strong management: deep and relevant expertise, incentives aligned to those of the fund
- ▶ establishing proper processes and structures with proven technologies
- ▶ commercially viable independent of government subsidies
- ▶ ideally break-through technologies or business models with a global market
- ▶ substantial barriers to entry, including intellectual property, development costs, availability of expertise or simply significant first mover advantage
- ▶ potential to scale internationally in “emerging markets” at home and abroad, where investment team can add value

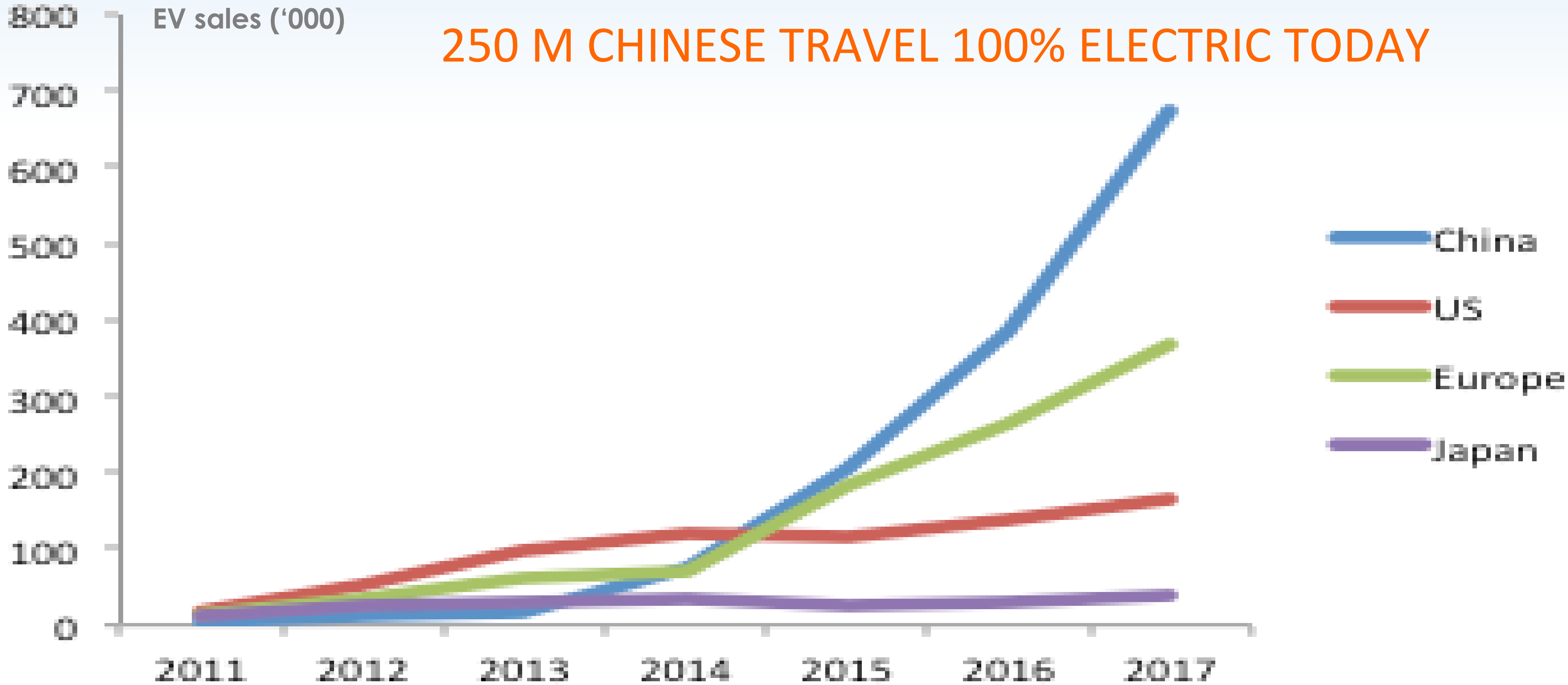
Investment Targets

- ▶ total investment per portfolio company: €5m–€30m
- ▶ 12–15 companies
- ▶ ownership 5%-50%, with strong rights
- ▶ potentially an “exponential organisation” as defined by Singularity University
- ▶ potentially a “unicorn”, ie, with an ultimate valuation > €1bn

DECARBONIZE FOR LOWER RISK AND HIGHER RETURNS =>
> €5tn DIVESTED FROM FOSSIL FUELS AND RELATED SECTORS



95% OF FUTURE GROWTH IN LEAP-FROGGING EMERGING MARKETS



GREEN GROWTH FUND 2...

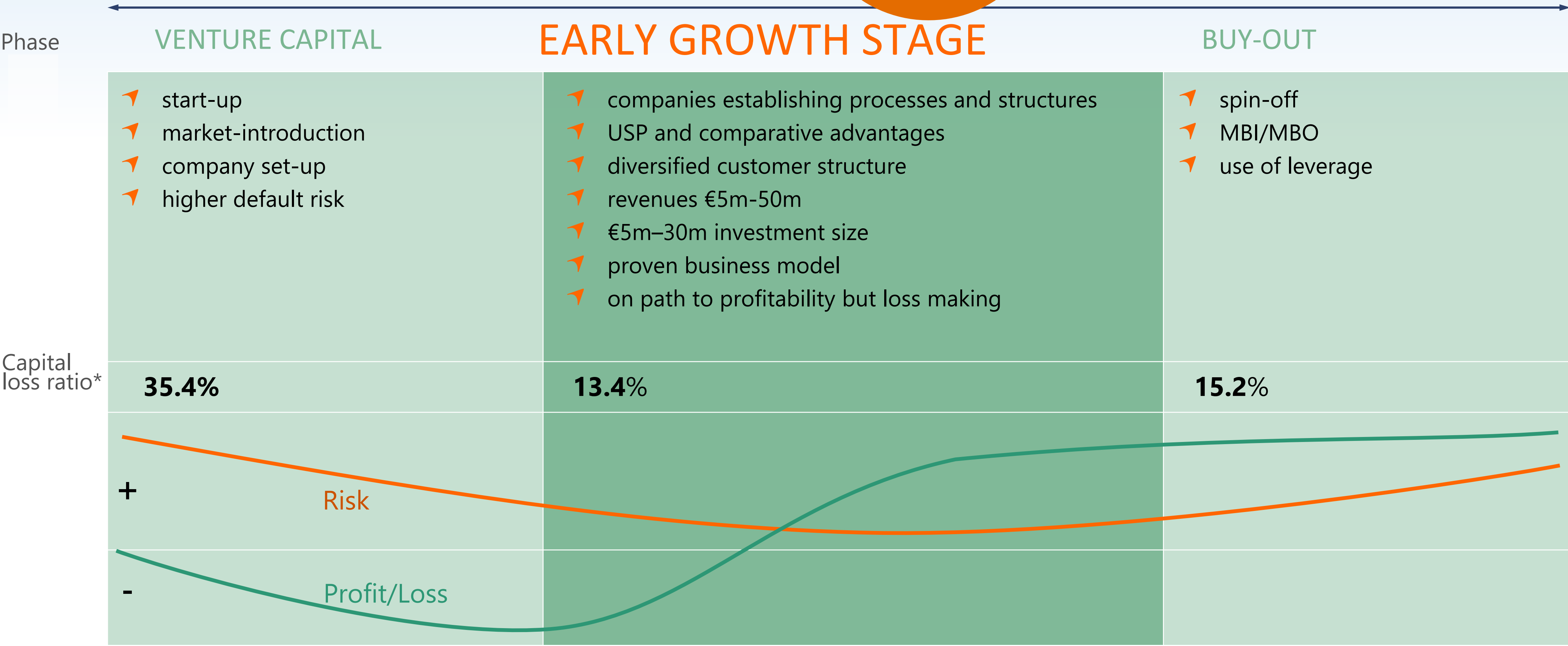


- ▶ ... aims for **>20% net investor IRR, 3 – 10x multiples**
- ▶ ... provides **growth equity to EU SMEs** with **> €5m in revenue**, making their clients more resource efficient
- ▶ ... benefits from **green revolution megatrends**
- ▶ ... assists EU firms to **sell to growth markets**, e.g. where **energy consumption/ unit of GDP 4x EU levels**

▶ ...has a positive impact on the environment, and addresses the following UN SDGs:



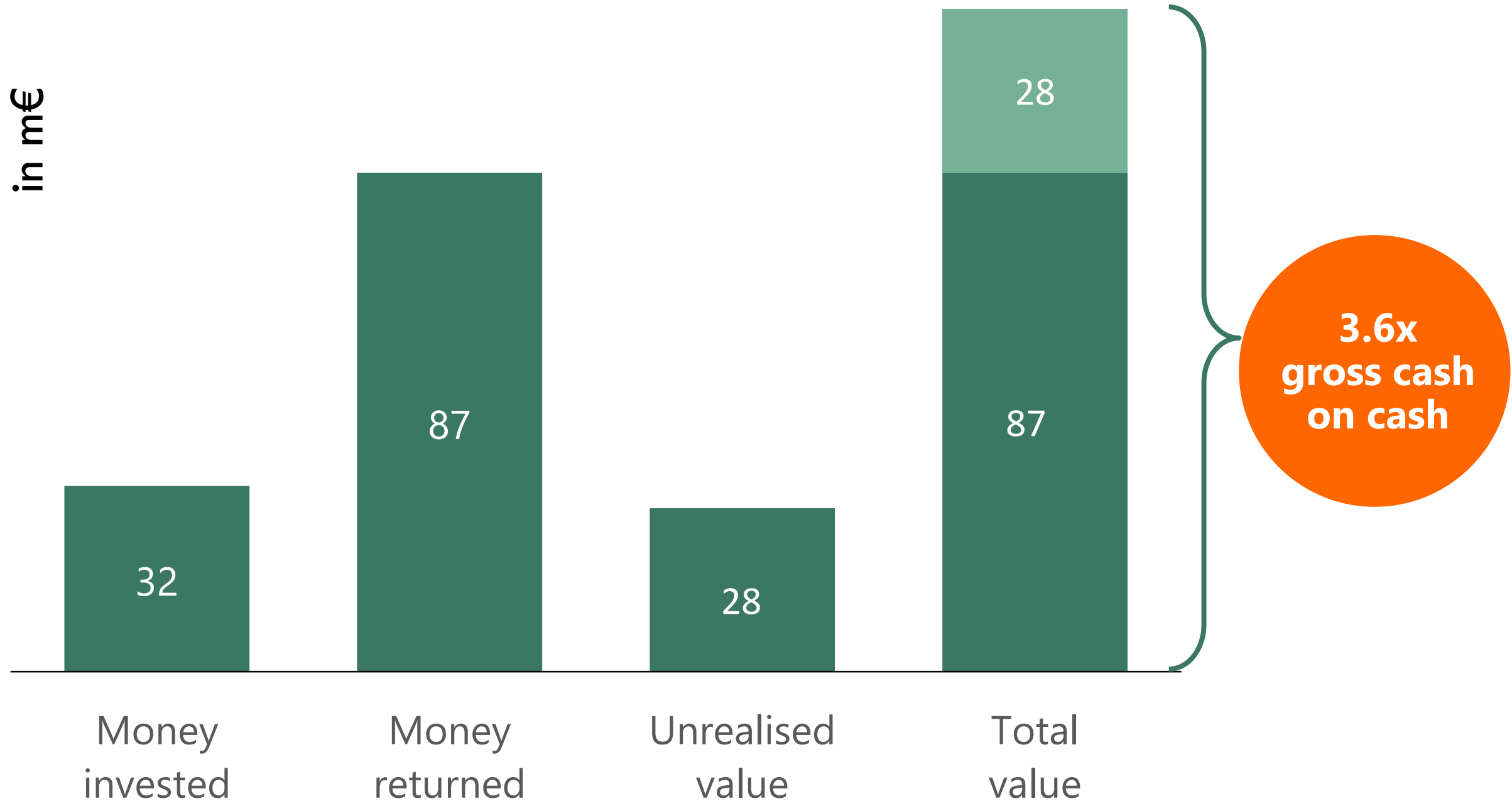
INVESTMENT FOCUS



*Source: Cambridge Associates; Database as of 31.03.2012, Analyses of 260 growth stage investments, 22,507 venture capital investments, and 5,188 leveraged buy-out investments made 1992 -2008 in the USA. Loss Ratio = percentage of capital in deals realised below cost, net of any recovered proceeds, over total investment capital.

TRACK RECORD

Top quartile Cash on Cash return of **3.6x** in 4.5 years on investments by Lead Partner in spe



GREEN GROWTH FUND 2: KEY TERMS AND CONDITIONS

Target fund size	€250m, of which €5m from the investment team
Structure	Closed-end German Limited Liability Partnership (GmbH & Co. KG)
Scheduled term	10 years: envisaged 6-year investment period + 4-year wind-down period (+2 yearly extensions)
Reinvestment of returned capital	Allowed until invested capital equals 100% of Commitment
Net aimed-for returns to investors	> 2x on called capital > 20% IRR p.a.
Management fee	2% net on Commitment, stepping down over time (subject to 19% VAT at the moment) up to 25% more investments for same amount of fees, due to reinvestment of capital
Carried interest with catch-up	20% above Hurdle
Financial Hurdle	25% of Commitment
Impact Hurdle	Carried interest due only if Impact Hurdle is also met
Minimum Commitment	€10m, lower amounts for selected investors
Rolling Initial Close	through First Close
Final closing date aimed for	31 March 2019

More
value for money
due to
reinvestment



PORTFOLIO & PIPELINE COMPANIES GGF2

Renewable Energy

Agriculture, Energy Efficiency

Mobility

Food



NEXWAFE



Nexwafe has developed a disruptive production technology for silicon wafers, saving 50% of energy, material and cost. The global market was €1.2bn in 2017 and is expected to reach €4.9bn in 2018.



SCHUEFELEN

Founded in 1855, Scheufelen is focused on grass paper for food packaging with about half the energy, water and CO2 footprint of traditional paper. It is a cost-competitive alternative to cellulose-based paper without the health risks of recycled paper.



"ECOBUS"



Zero emission electric bus, capable of operating 24/7 with lowest total cost of ownership, charged in 2-5 min with a 300kW charger. Future cities will drastically reduce individual transportation, Shenzhen just ordered 16,000 electro-buses vs Berlin's 45

"VEGGIE-MEAT"

Non-bovine foods have only 5% of the CO2 footprint of meat. No animals suffer from factory farming. The global processed meat market is to reach \$800bn in 2018. This new non-meat food tastes like meat and has identical structure as original meat from chicken, cow or pig.



BIO DÖNER CHUNKS*

BIO HACK

NEXWAFE GMBH

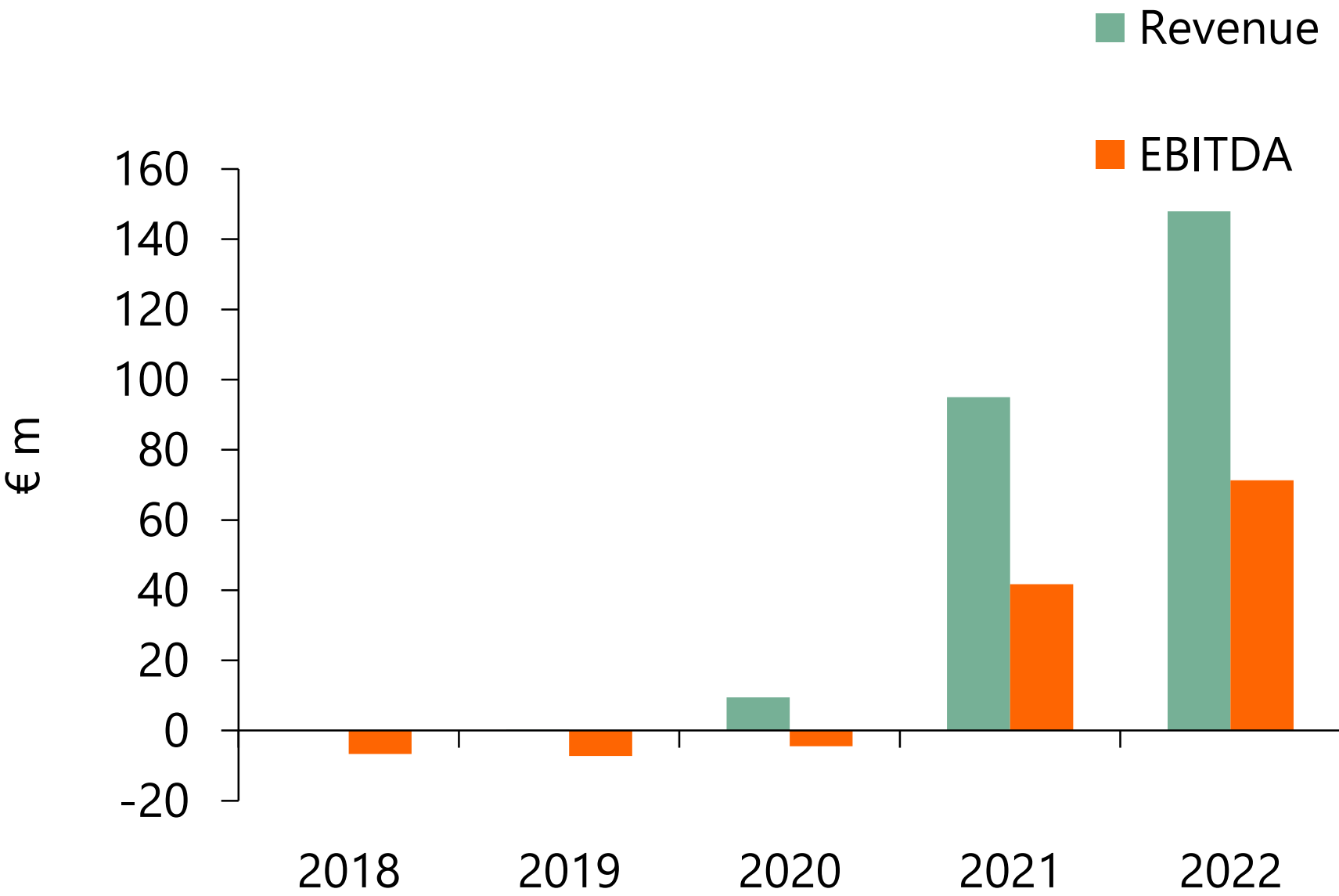
New process to manufacture silicon wafers for the production of solar cells

First portfolio company



DETAILS

Location	Freiburg, Germany
Products & services	High quality low cost production of solar wafers requiring only 50% of the energy and material needed for traditionally manufactured silicon wafers
Customer base	Global solar photovoltaic cell and module producers, market size in 2018 ca. €60bn
Investment size	€2m invested in Dec. 2017, option to further invest €2m within 12 month
Impact	By 2022 Nexwafe plans to have a capacity of 1.25 GWp of wafers, this transforms into solar cells would eliminate 630.000 t of CO2 emissions annually



WAM estimates

SCHEUFELN GMBH

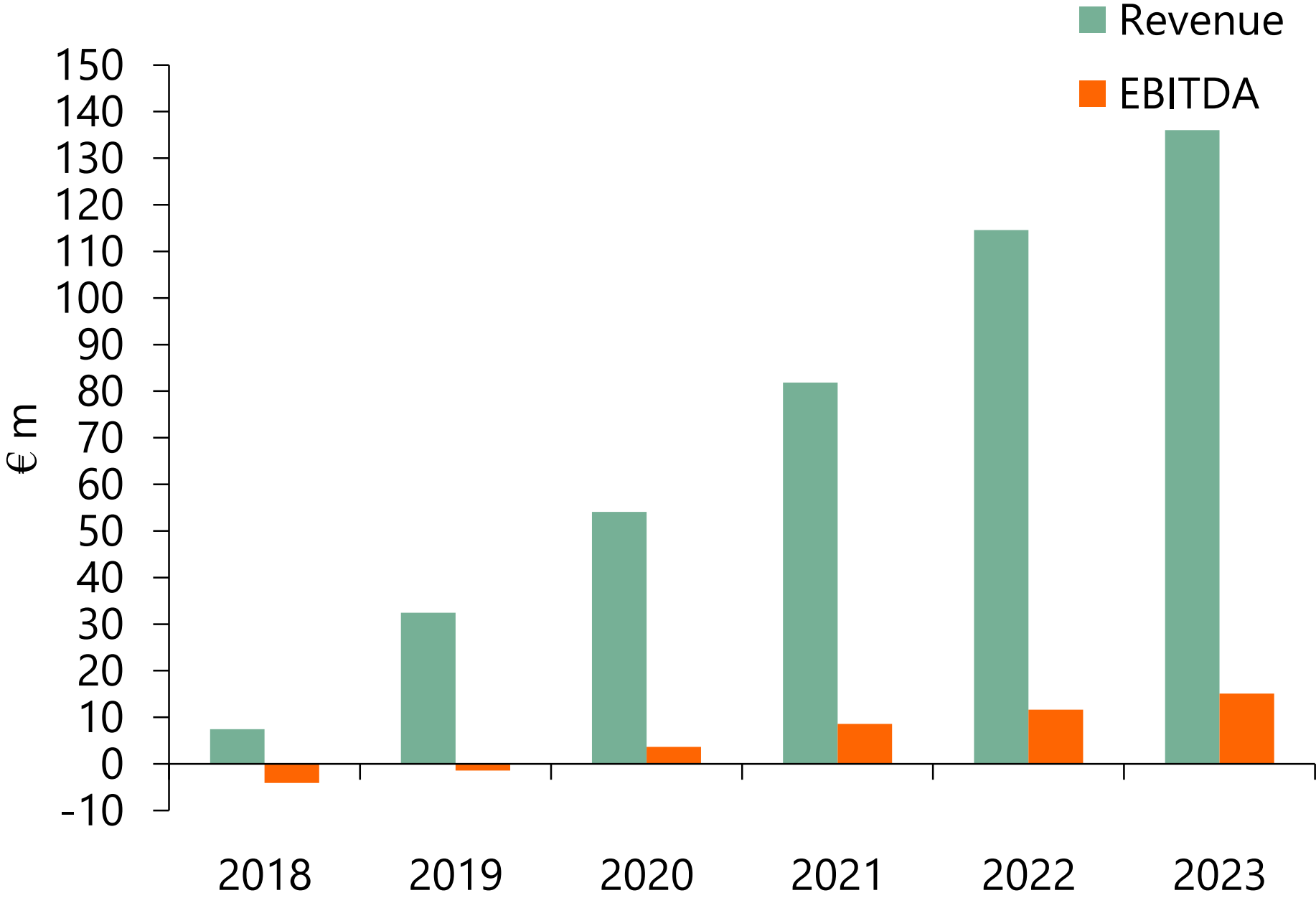
Grass paper for food packaging, a cost-competitive alternative to cellulose-based paper and without health risks of recycled paper

DETAILS

Location	South of Germany
Products & services	Grass paper for food packaging with about half of the energy, water and CO2 footprint of traditional paper
Customer base	Global food and packaging companies
Investment size	€1.67m invested in July 2018
Impact	Grass paper significantly reduce the use of water, energy and chemicals in comparison to both cellulose-based paper and recycled paper



Second portfolio company



WAM estimates

Conclusion

GREEN REVOLUTION:

AN OUTSTANDING OPPORTUNITY FOR SMART INVESTORS IN:

ITS CRADLE: GERMANY, BENELUX AND THE NORDICS,

HOME OF RESOURCE EFFICIENT COMPANIES & POLICY FRAMEWORKS

RESOURCE EFFICIENCY = PROFITABLE & GOOD FOR THE ENVIRONMENT !

SUPPORT OF EXPORT TO EMERGING MARKETS: STRONG PROFITABLE GROWTH!

“THE STONE AGE ENDED LONG BEFORE WE RAN OUT OF STONES

SAUDI OIL MINISTER SHEIK YAMANI, 2000







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