



COVID-19 – Märkte und Strategien im Wandel

GreenTech in
und nach der Krise

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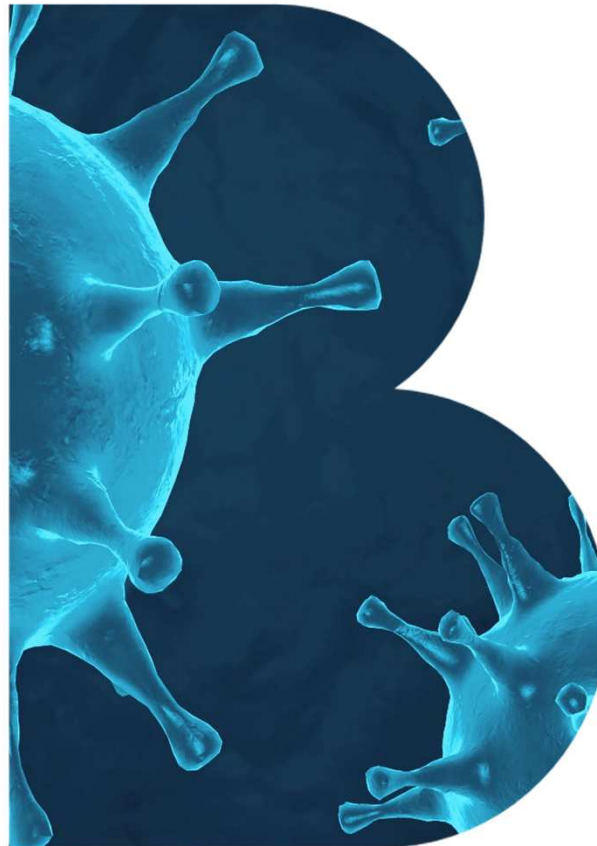


Agenda

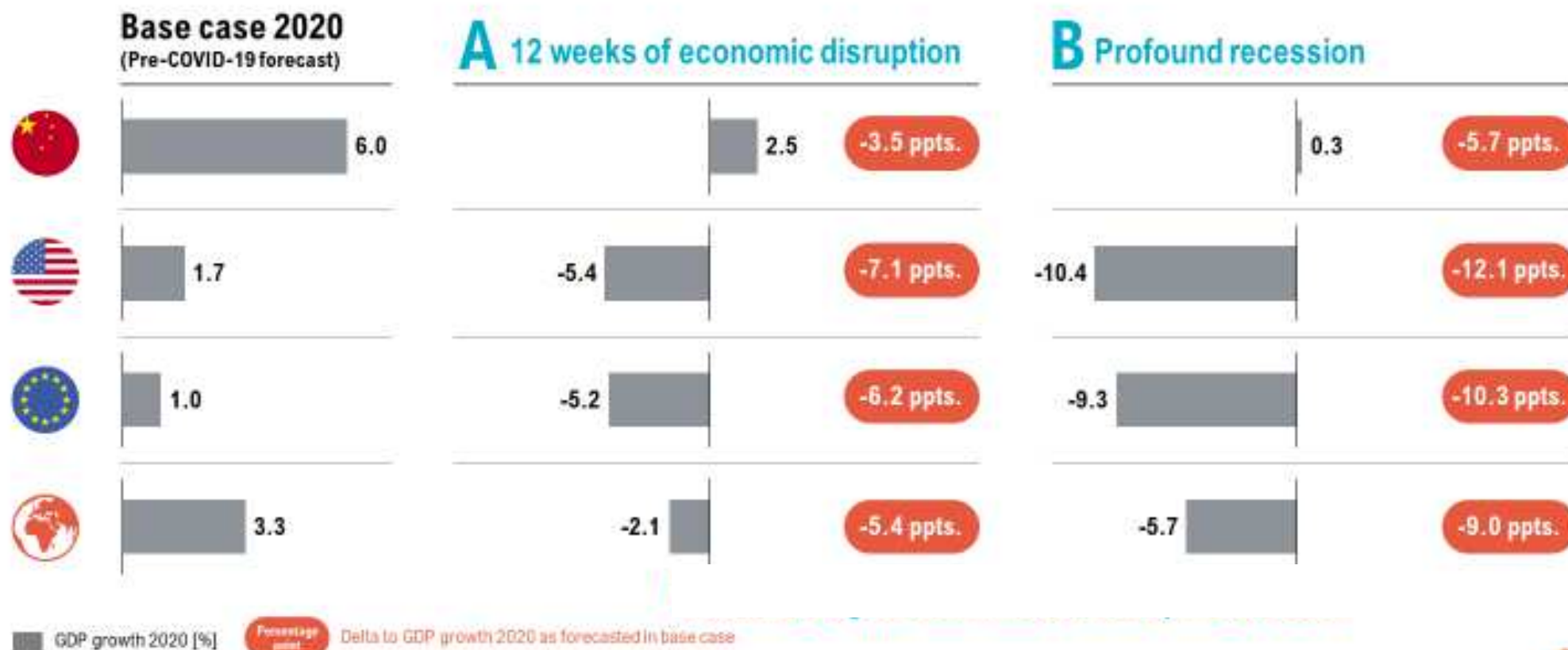
Seite

Teil 1: Green Tech Märkte – Änderungen, Herausforderungen & Chancen	3
Teil 2: Strategien in und nach der Krise für nachhaltiges Wachstum	12

Teil 1: Green Tech Märkte – Änderungen, Herausforderungen & Chancen



Depending on duration of economic disruption and scope of gov. measures, global GDP could be up to 9 ppts. lower than forecasted

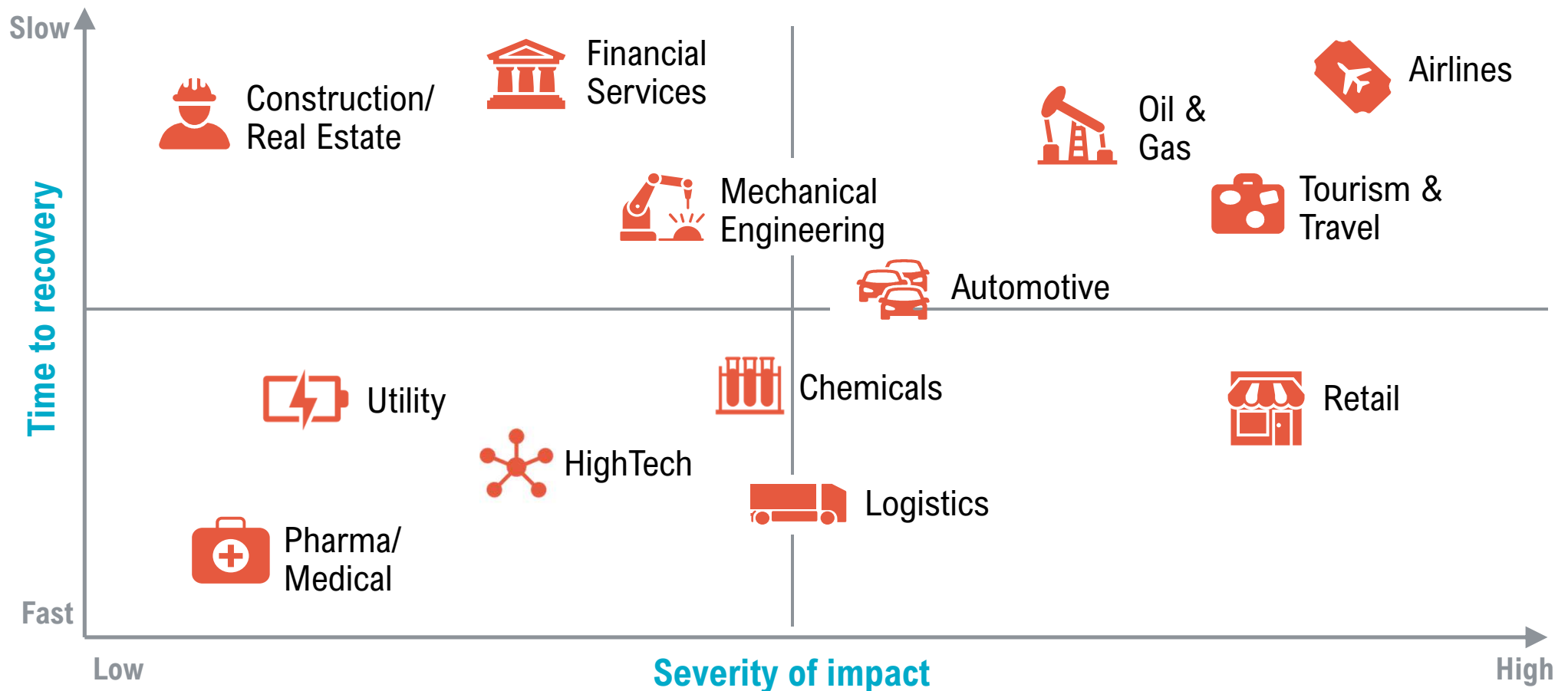


Roland Berger estimates as of April, 2020

Short term to recovery within Pharma, HighTech and Utility – high severity of impact in Retail, Tourism and Airlines

Severity of impact and time to recovery by industry

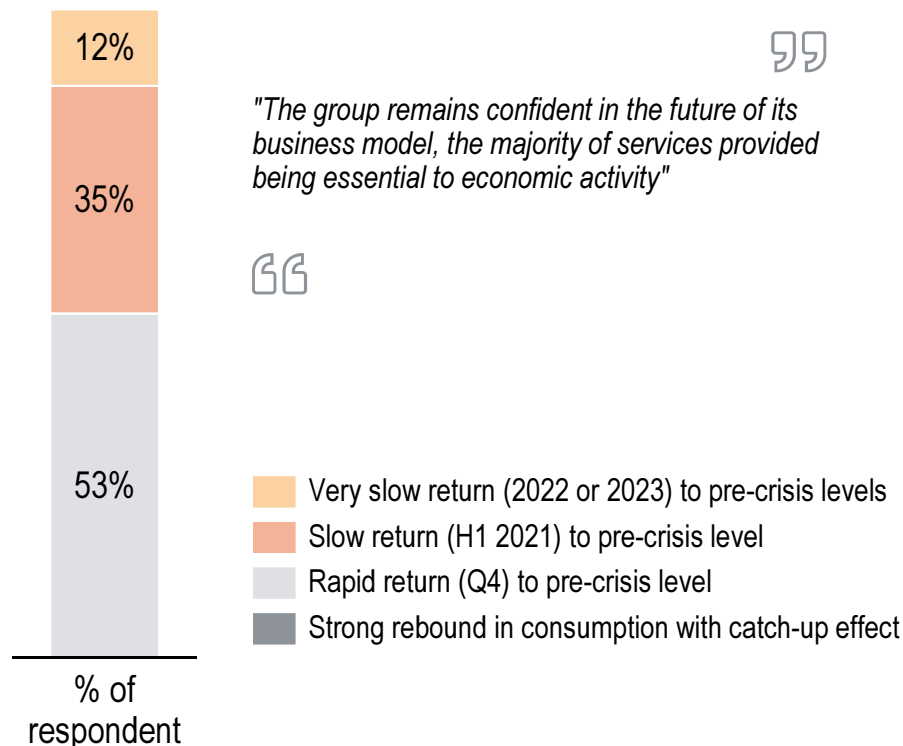
**Roland Berger
estimates as of
April, 2020**



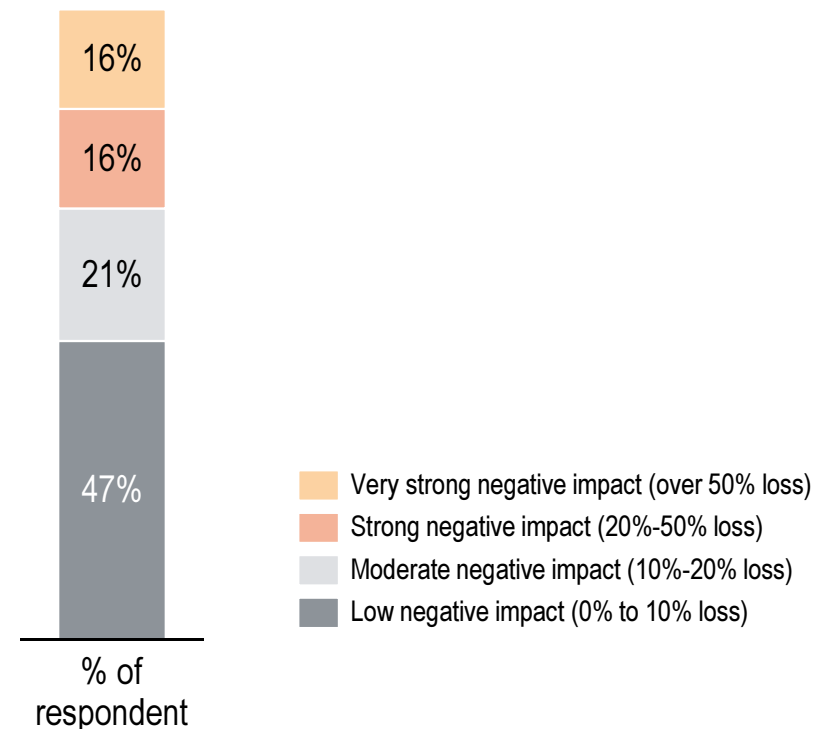
The utilities sector expects a quick recovery, with most of the impact behind by Q3, tempered by a high level of uncertainty

Utility: Time to recovery and severity of impact

Expectation when business picks up again

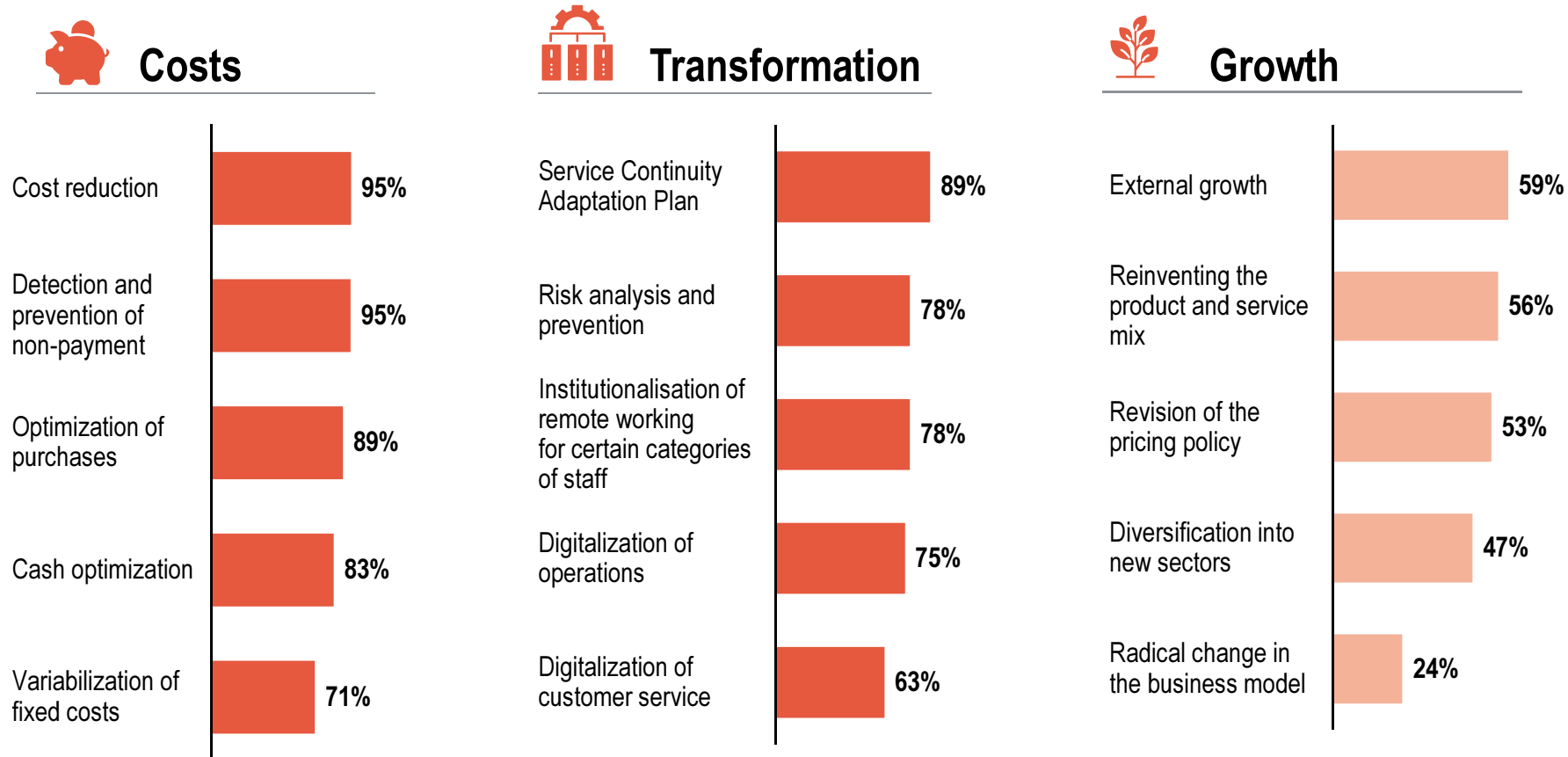


Loss of EBITDA margin vs. budget [%]



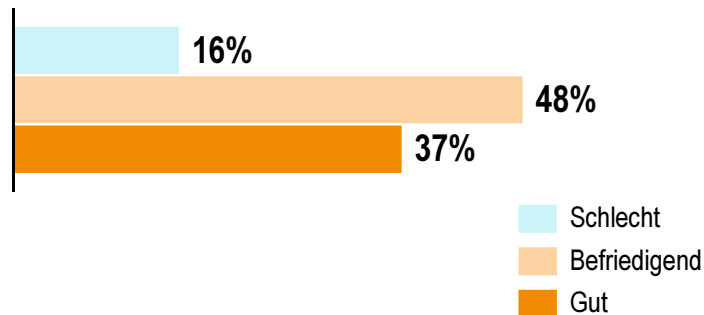
Utilities plan to mostly carry out costs and transformation projects, growth projects being less priority

Utility: Projects to be implemented post Corona crisis

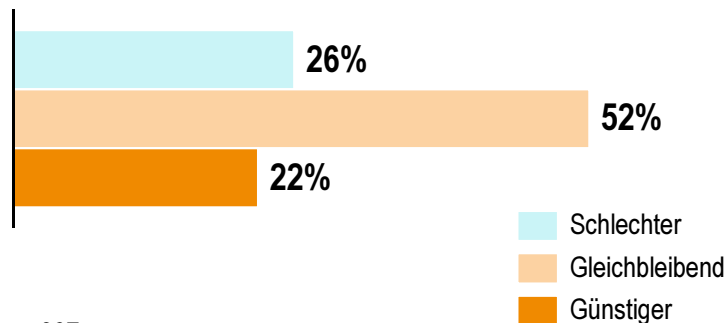


Die Unternehmen der GreenTech Branche sieht sich gegenüber der Gesamtwirtschaft im Vorteil

Wie beurteilen Sie Ihre gegenwärtige Geschäftslage im Bereich der Umwelttechnik und Ressourceneffizienz?

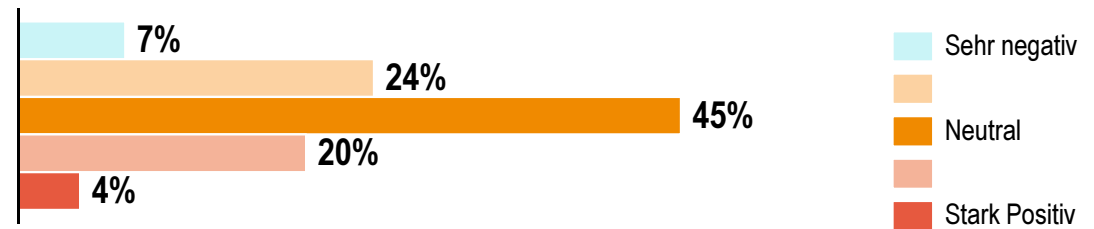


Wie beurteilen Sie Ihre Geschäftserwartungen für das nächste Jahr im Bereich der Umwelttechnik und Ressourceneffizienz?

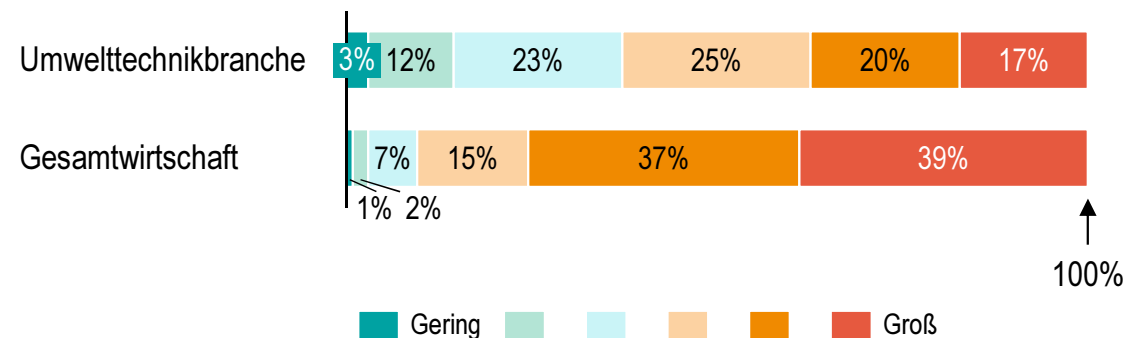


n=397

Wie beeinflusst kurz- und mittelfristig die Corona-Krise die Einführung und Umsetzung einer nachhaltigen und umweltverträglichen Unternehmensführung in den Unternehmen?



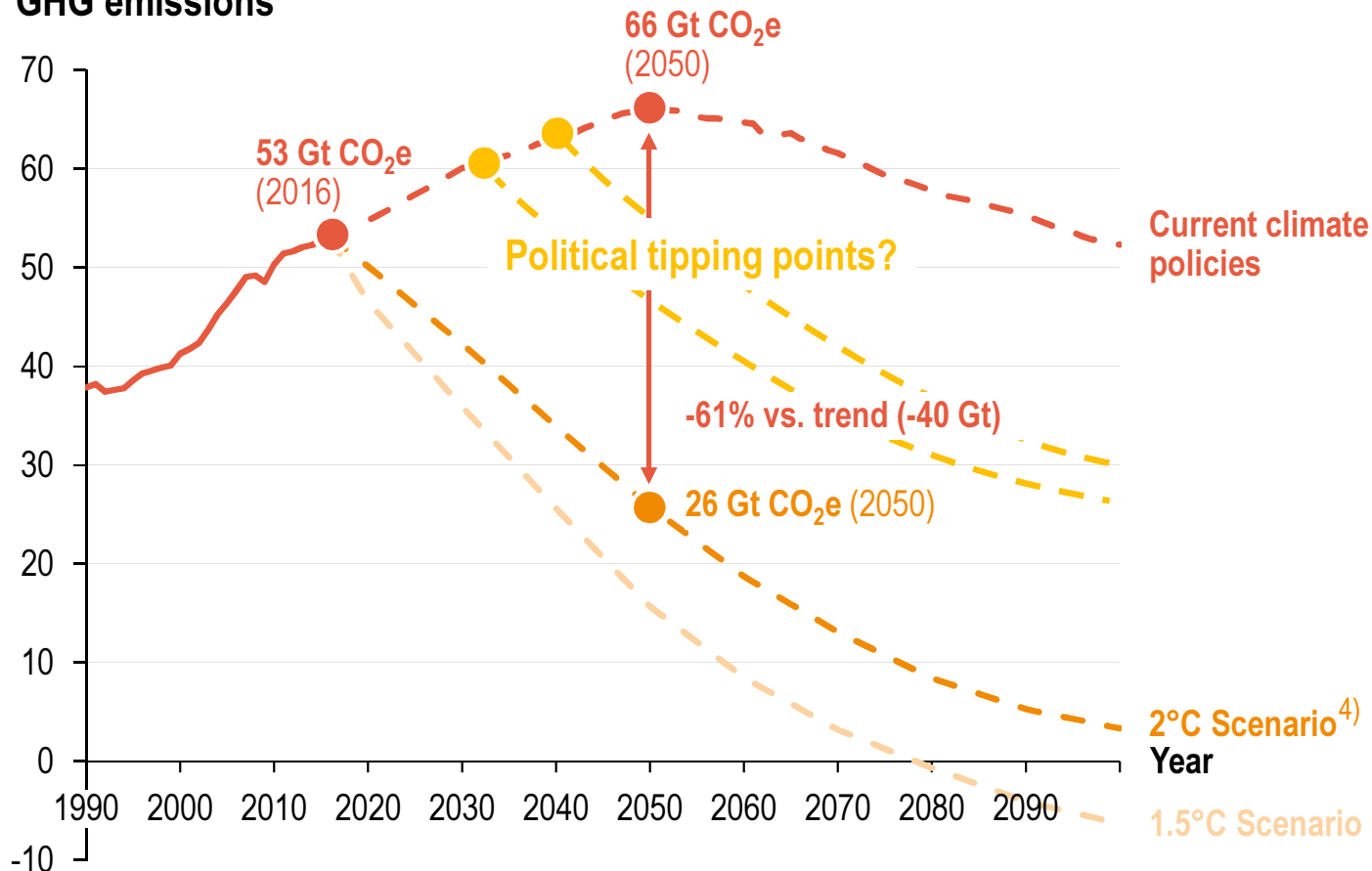
Wie beurteilen Sie mittelfristig die Herausforderungen durch die Corona-Krise für die Umwelttechnikbranche im Vergleich zur Gesamtwirtschaft in Deutschland?



The gap between action (not) taken and action needed to reach the climate goals is likely to cause a costly disruption – Pressure to act

Worldwide raw GHG¹⁾ emissions²⁾ [Gt CO₂e³⁾ / year ; world]

GHG emissions



- > Current climate policies and regulation lead to an increasing gap between climate change goals and actual global GHG emissions
- > As reaching climate goals will become more difficult the need and pressure for more radical (regulatory) measures will increase
- > We expect a political tipping point that will cause a disruption with need for fast and very costly adaptation
- > **Although Covid-19 may delay certain regulatory measures slightly, we expect the pressure for sustainability to remain**

1) GHG: Greenhouse Gas; 2) Historical data available up to 2014 (2015-2020 data retreated);
3) CO₂, CH₄, N₂O, SF₆, CnHmFp, CnF2n+2, CnCImFp; 4) 2°C Median GIEC Scenario

Chance: Green recovery program and the "new normal" as an accelerator for the green transformation of the industry

GreenTech growth driver – Accelerated by COVID-19

Preliminary Hypotheses

- » **Elektrifizierung und Wasserstoff:** Erneuerbare Energien, Energieeffizienz, Elektrifizierung industrieller Prozesse, Smart Grid, Grüner Wasserstoff, Power-to-X
- » **Digitale Transformation:** Datengetriebene Geschäftsmodelle, Künstliche Intelligenz, Industrie 4.0 und IoT, Digitaler Zwilling
- » **Circular Economy:** Nutzung wiederverwendbarer Materialien, Maximierung der Nutzungsdauer, Rückgewinnung von Neben- und Abfallprodukten
- » **Smart City:** Innovative und sektorübergreifende Lösungen für mehr Umweltschutz, Wirtschaftswachstum und gesellschaftlichen Ausgleich im urbanen Raum

Challenge: In the post COVID-19 era, efficiency and localization of supply chains will have a significant and uneven impact

Possible paradigm shift in the course of COVID-19 recovery

Preliminary Hypotheses

Pre-COVID era – GLOBALization

Post-COVID-19 era – LOCALization

Global Production networks

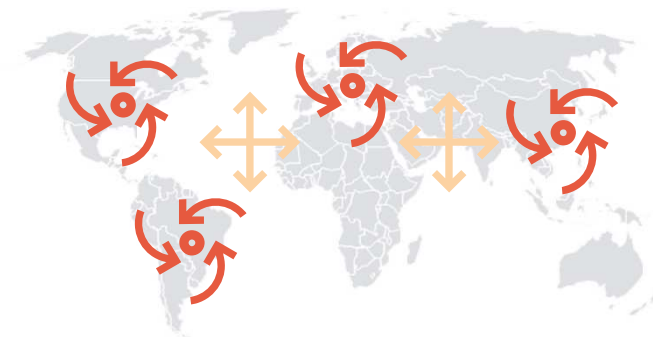
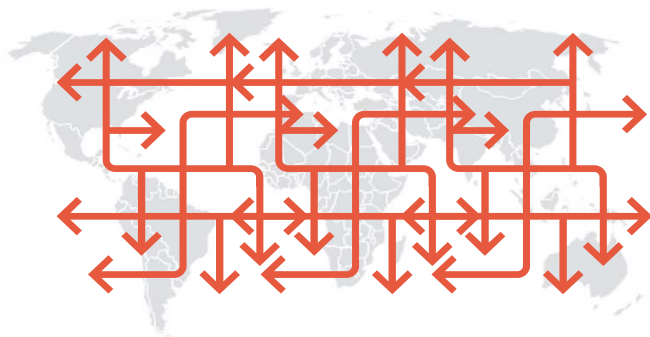
Localized Production networks

Global Supply-Chain networks

Local Supply-Chain networks

Global JIT / minimized stock strategies

Local warehouse- and reserves strategies



Global delivery footprint

Build where you sell

Customer-specific variants

Variant reduction (Reduce to the max)

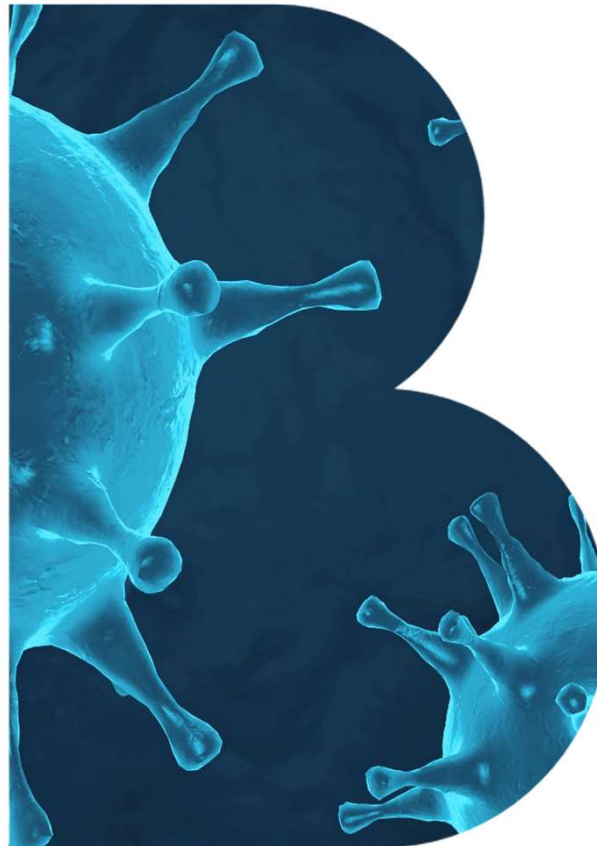
Evolutionary efficiency increase

Radical efficiency improvement

Limited risk management

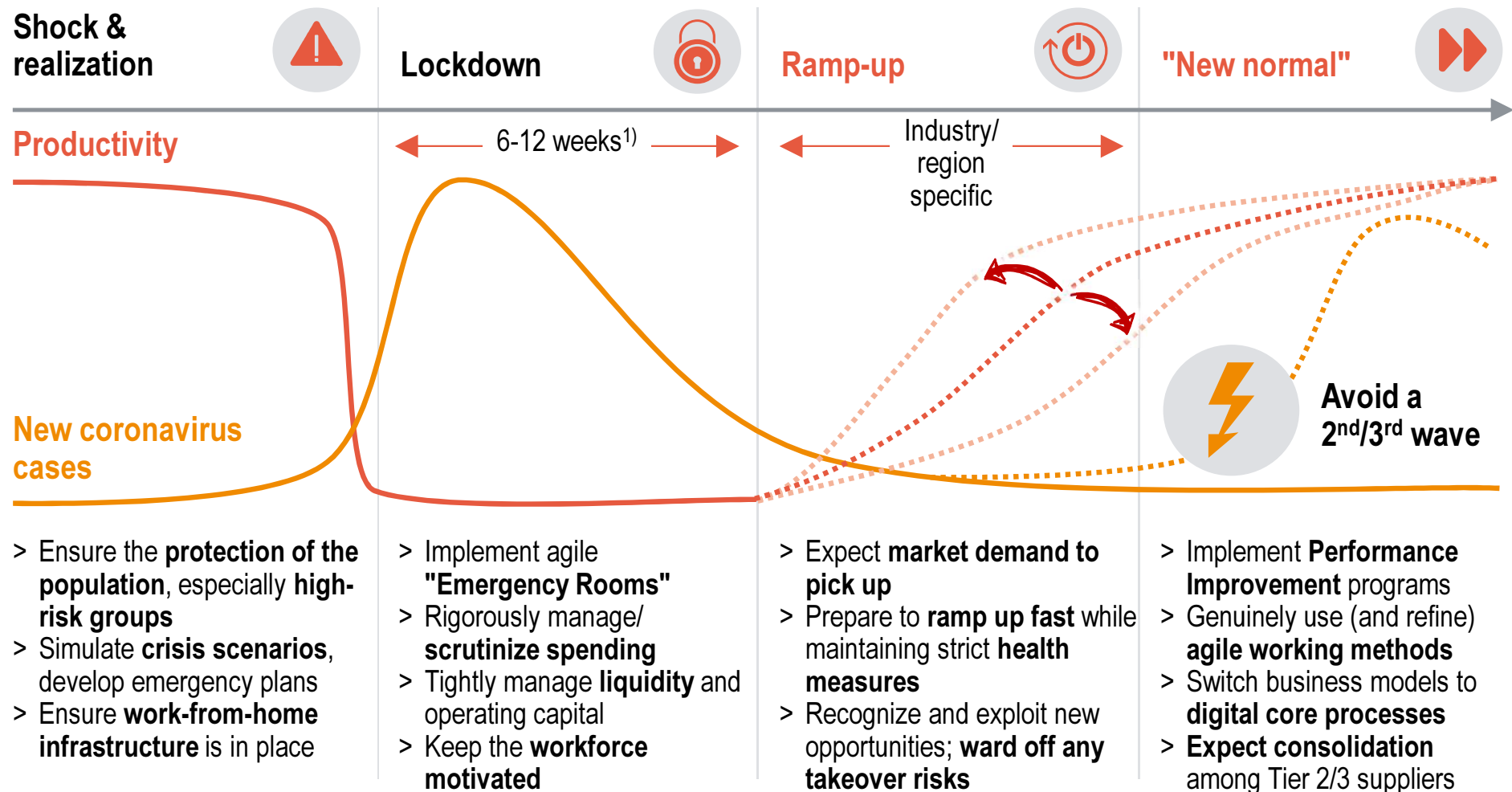
Sustainable risk management
(expect the unexpected)

Teil 2: Strategien in und nach der Krise für nachhaltiges Wachstum



After ensuring employee health and implementing strict cost measures, it's now time to prepare for ramp-up and a "new normal"

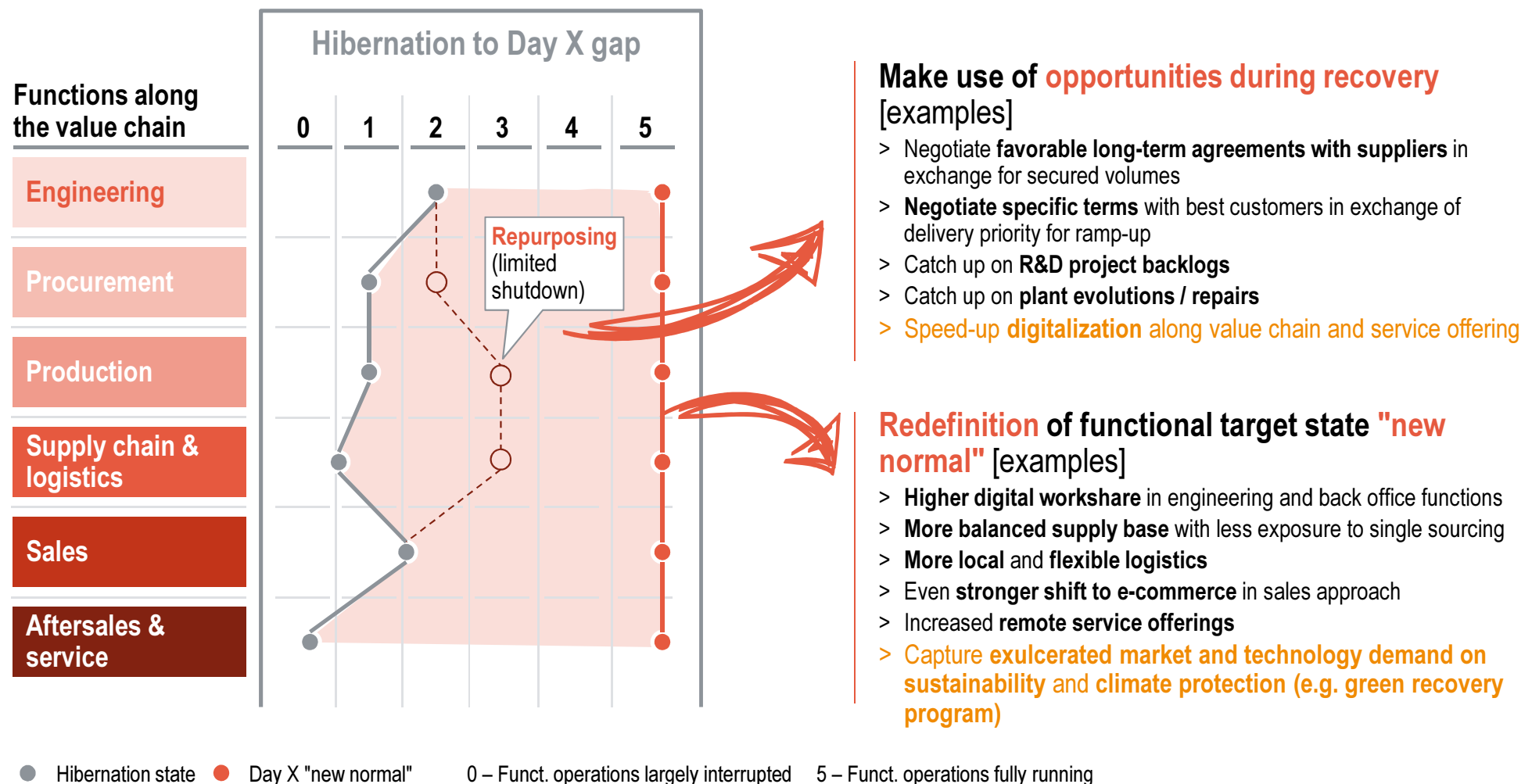
Crisis phases and priorities



1) Duration dependent on regional ordinances

A measure program will help to move from hibernation to Day X and the "new normal" – Opportunities to be seized along the way

Assessment of gap between hibernation state and Day X



Environmental data is the new raw material for new smart business models and applications: Combining **ecology** and **economy**

Data value chain



Environmental data



Sector specific data

- | | |
|-----------------|--|
| Mobility | <ul style="list-style-type: none"> > Public transportation mix > Traffic intensity > ... |
| Energy | <ul style="list-style-type: none"> > Energy generation mix > Energy consumption > ... |

New data driven business models and applications



Impact (e.g. Energy efficiency)

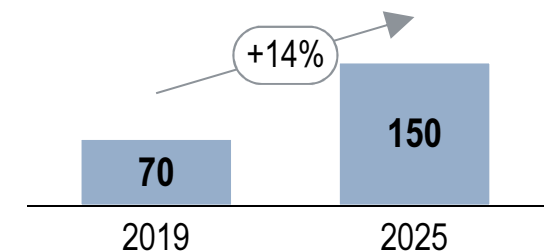
Ecology & ...

Energy efficiency¹⁾ **+15%**

CO₂ reduction²⁾ **-1,700 Mio. t**

... Economy

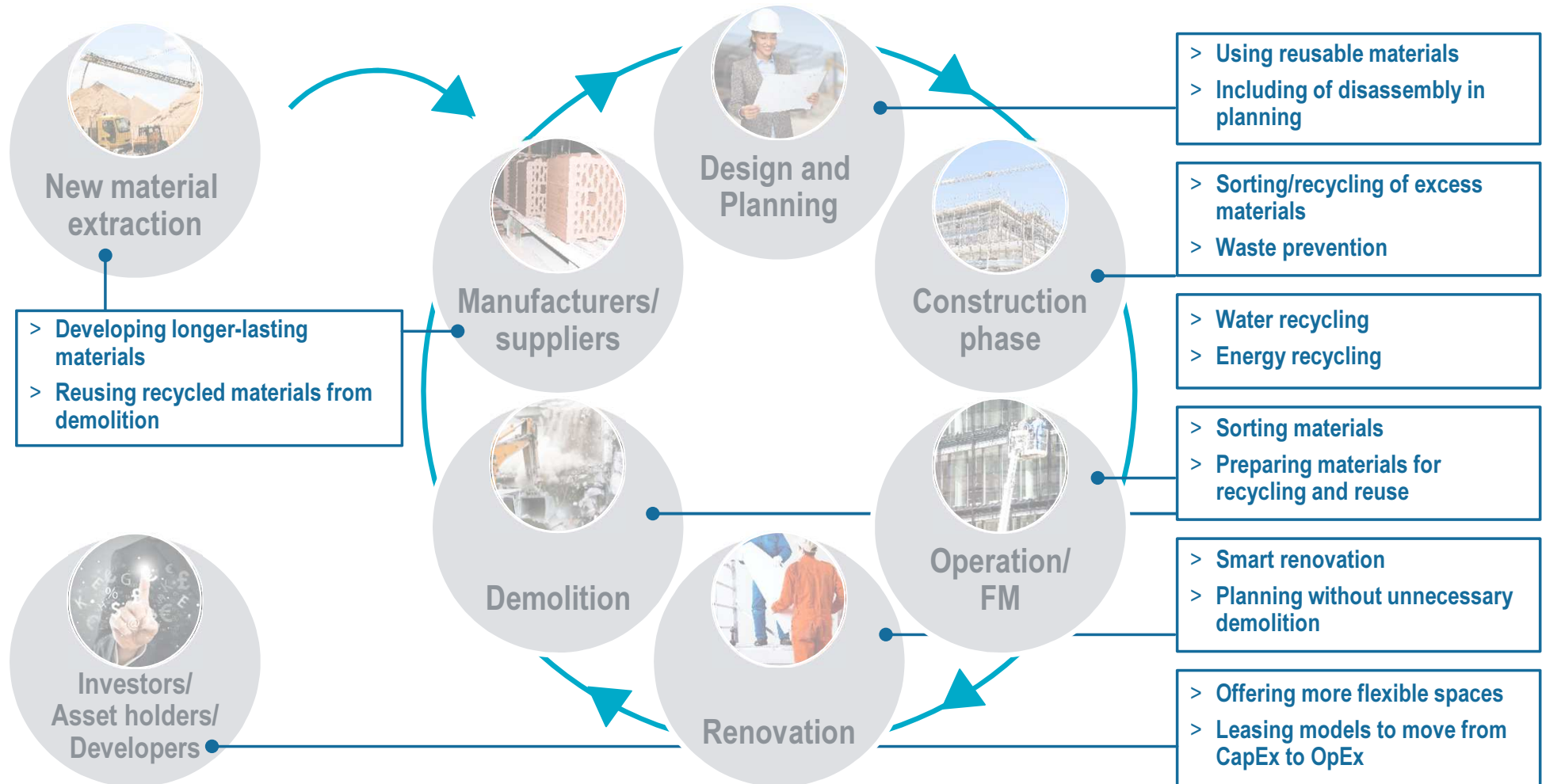
Global market size³⁾ [EUR bn], CAGR



1) Average across sectors, 2025 2) Global p.a., 2025 3) Software & Services for energy efficiency solutions

The circular economy impacts all elements of the value chain reducing input and output factors

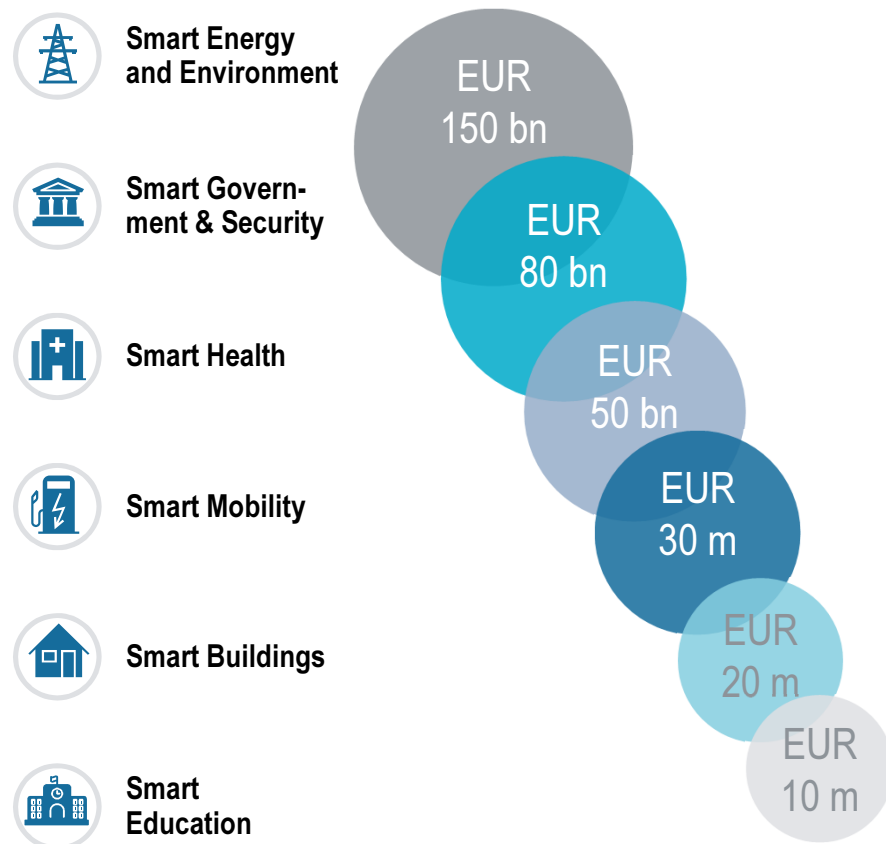
Example: Circular economy along the construction value chain



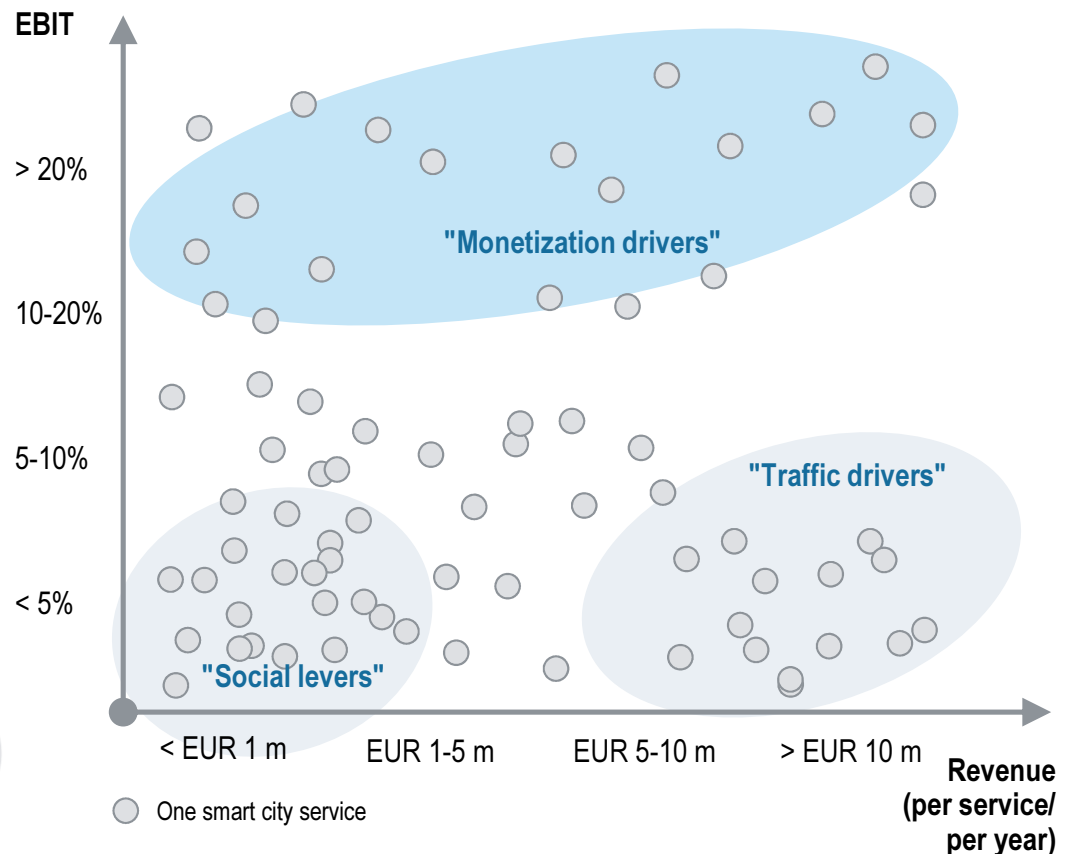
There are profitable and not-profitable smart city services – with right packaging the business model looks attractive

Smart city services monetization potential (normalized for a city of 100 000 inhabitants)¹⁾

Smart city revenue potential by 6 action fields



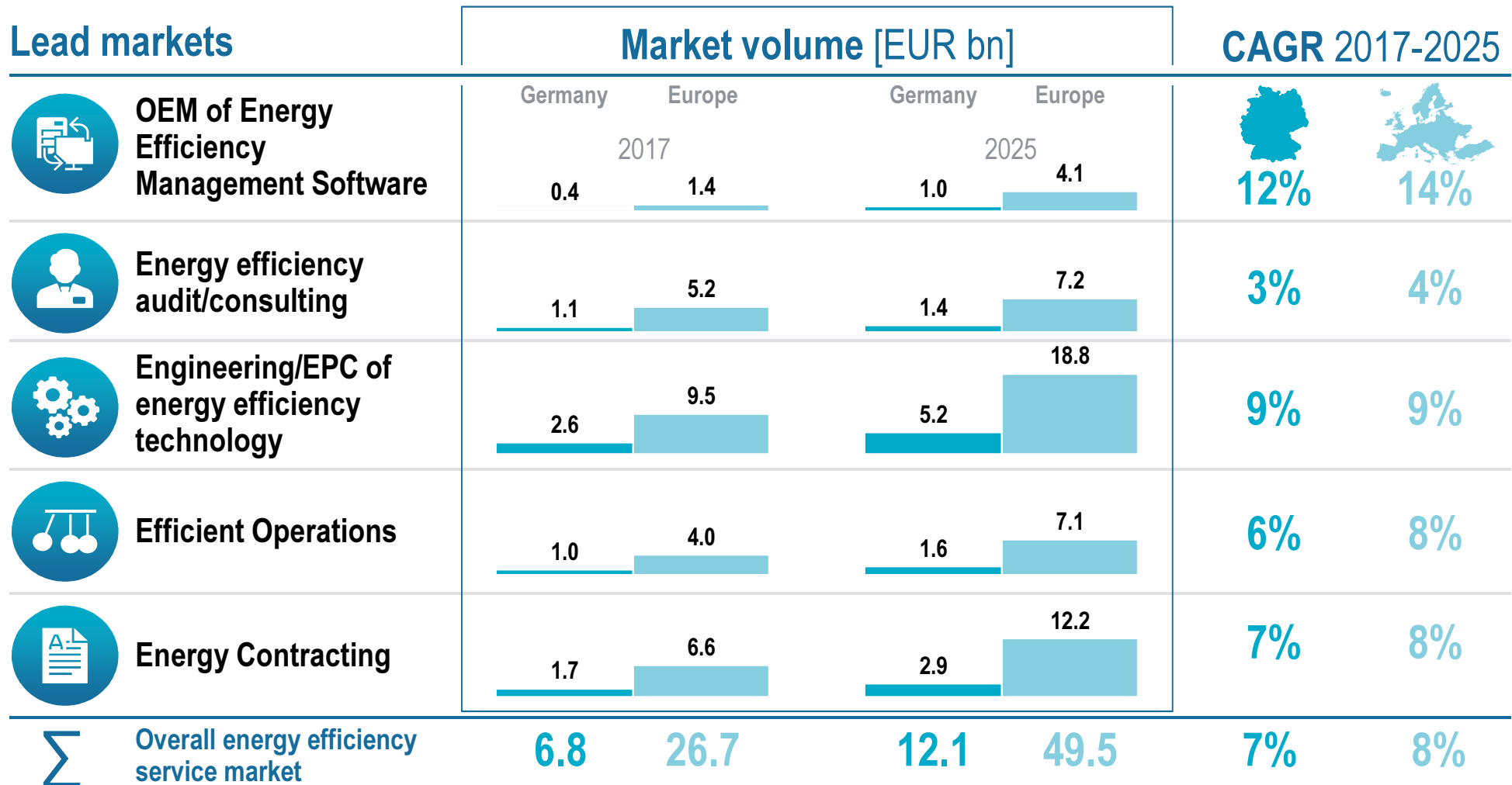
Service attractiveness matrix



¹⁾ Based on calculations for 5 cities of different size (20 000 – 1 000 000 citizens) from Roland Berger project experienced

OEM of Energy Efficiency Management Software is the lead market with the strongest growth in Germany and Europe until 2025

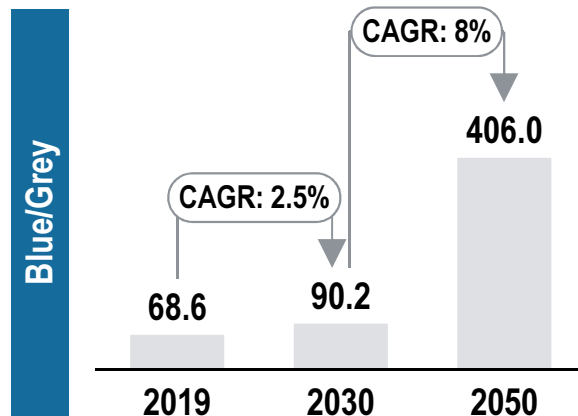
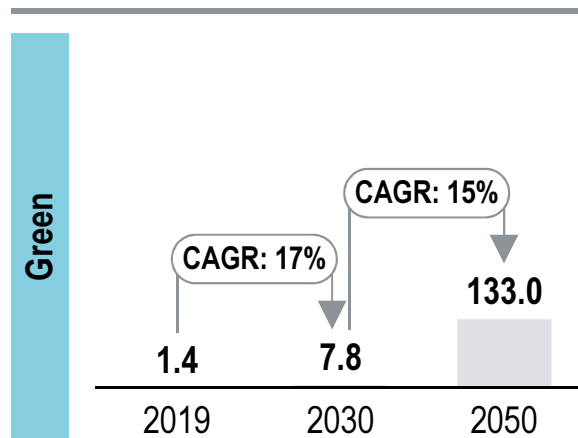
Overview of the market volumes of the lead markets



Markets for green and blue/grey H₂ will grow significantly by 2050, driven by decarbonization and new types of consumers

Main future hydrogen market technologies

Global market outlook [m t]



Main consumers

- > Mobility
- > Industry (dep. on volumes)
- > Energy (dep. on volumes)
- > Hydrogen hubs/valleys

- > Industry, esp. large consumers in oil refining, ammonia, chemical, steel production
- > Mobility
- > Energy
- > Hydrogen hubs/valleys

Key players



Production technologies

Electrolysis

By putting an electrical charge on water, the water is separated into pure H₂ and pure O₂

SMR/POX + CCS

Similar to SMR and POX, but the fairly pure stream of CO₂ is captured and stored, reducing CO₂ emissions

Partial oxidation

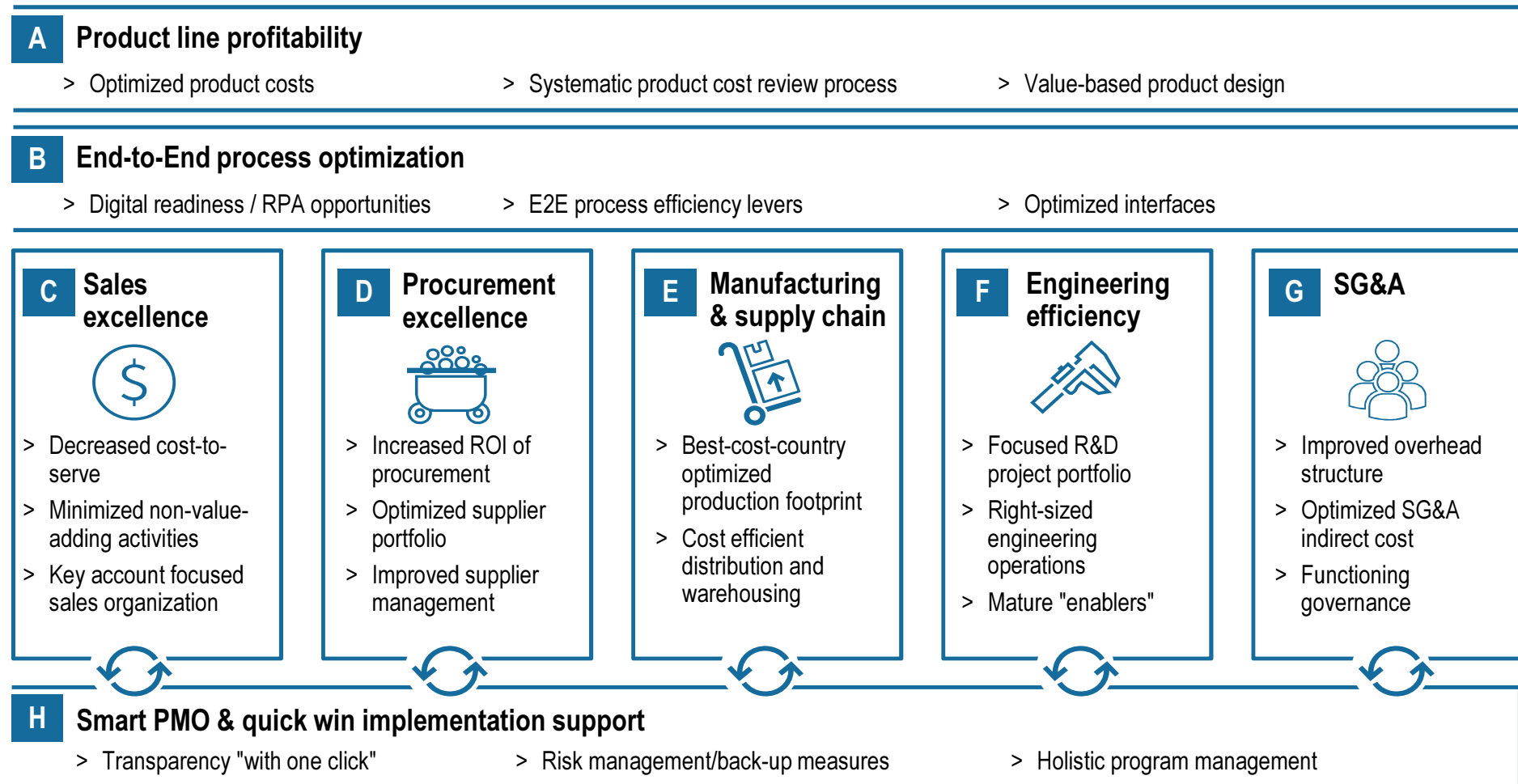
Coal gasification – Depending on the type of coal various additional gasses are produced, creating impure hydrogen

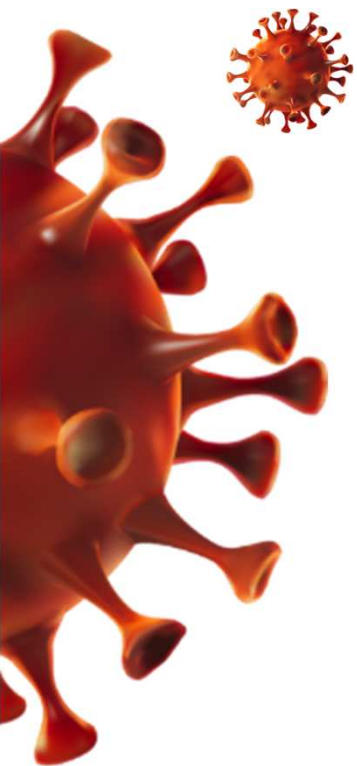
SMR

Steam is injected into a natural gas feedstock which separates the carbon and hydrogen atoms to form CO₂ and H₂

Companies will have to adapt their operating cost to the "new normal" by reaching the next level of efficiency across all functions

Roland Berger performance improvement toolbox





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