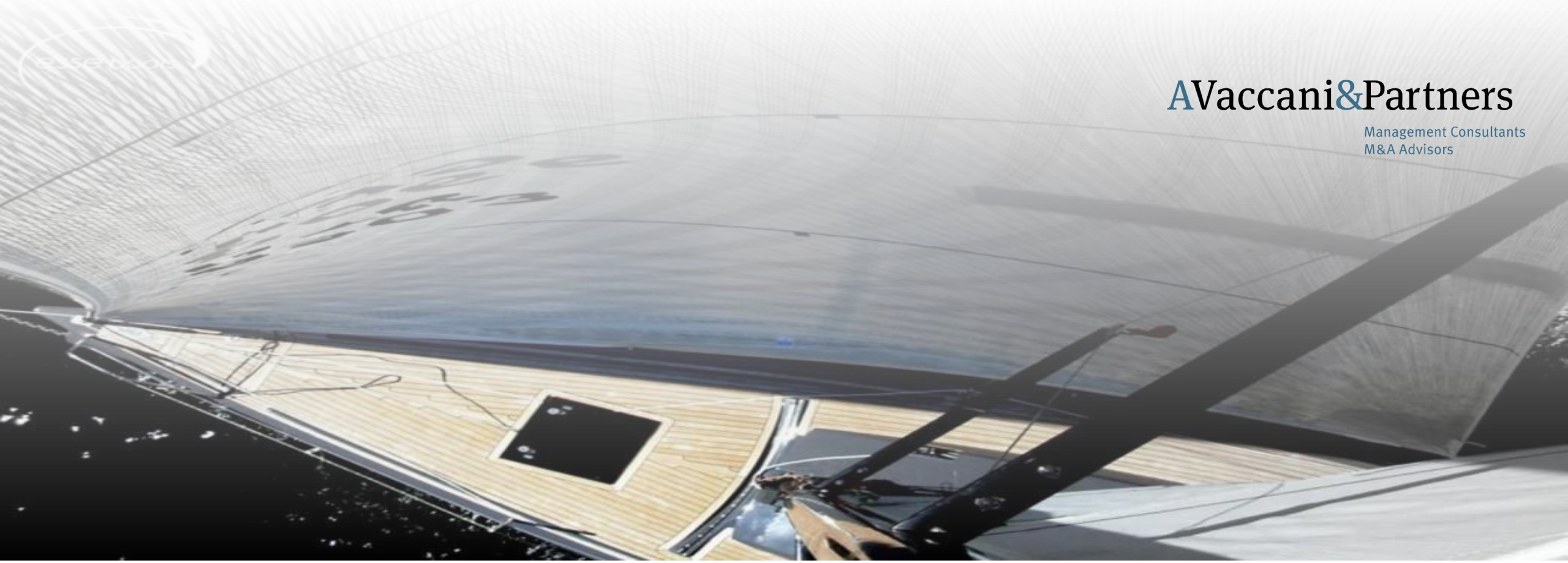

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A. Vaccani & Partners AG

COVID-19 Impact Analysis on the EfW and Waste Management Industry

9 July 2020

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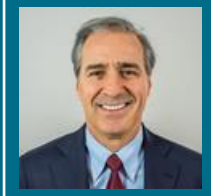
AVP is an independent international management consulting company located in Switzerland, founded 25 years ago



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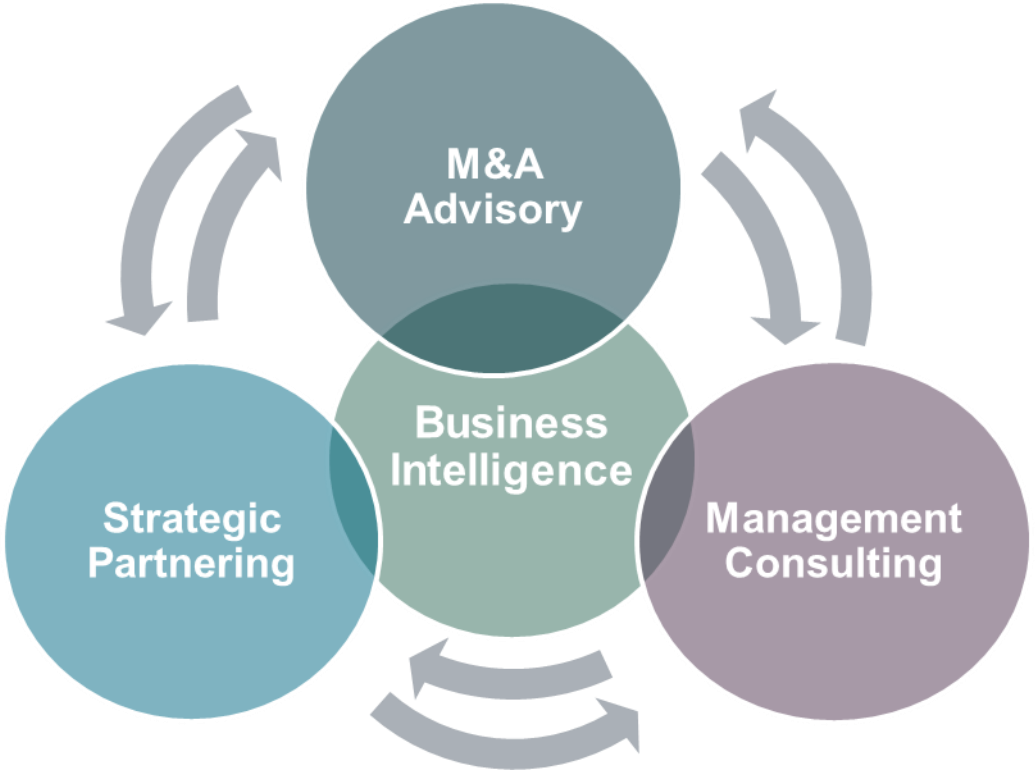

Business Intelligence

- Strategic market analysis
- Industry, competitor and customer analysis
- In depth business analysis based on market interviews and data base research

Proprietary databases

- **Award/market tracker WTE, Biomass, Multifuel (market shares, segmentation, trends)**
- Global structural market data (220 countries) environment, energy, incl. long-term forecast

References

100 M&A Transactions, mostly cross border, about 50% in Cleantech space, many involving Asian, European and US parties

Over 50 Tech Transfer/Partnering transactions in Cleantech space between Europe/US and Asia

60 Market Entry mandates in Cleantech space, mostly into Europe, Asia, North America

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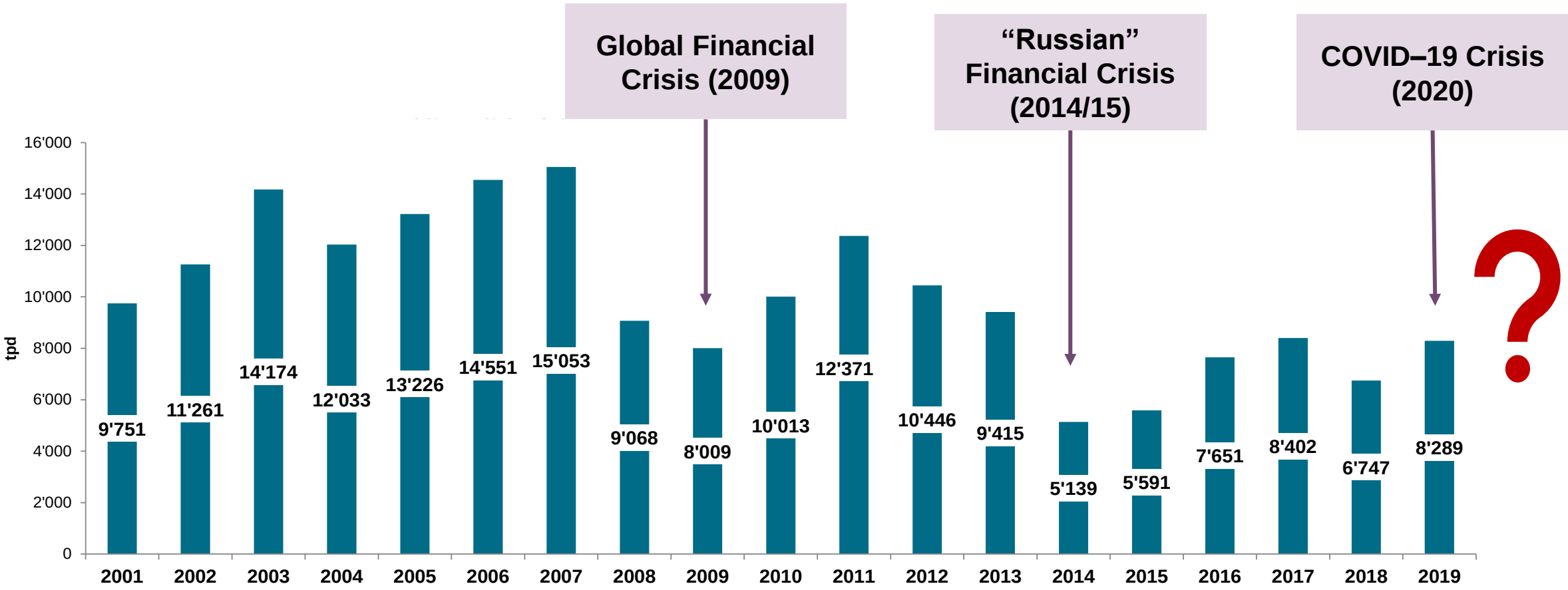
Agenda

1. **Survey Overview**
   - **Market confidence**
   - **Research uncertainties (factors)**
2. **Critical Uncertainties & COVID-19 Assumptions**
3. **Scenarios**
4. **AVP Market Forecasts**

COVID-19 Crisis – an Unprecedented Event

Annual Award Volume EMEA (2001 – 2019)



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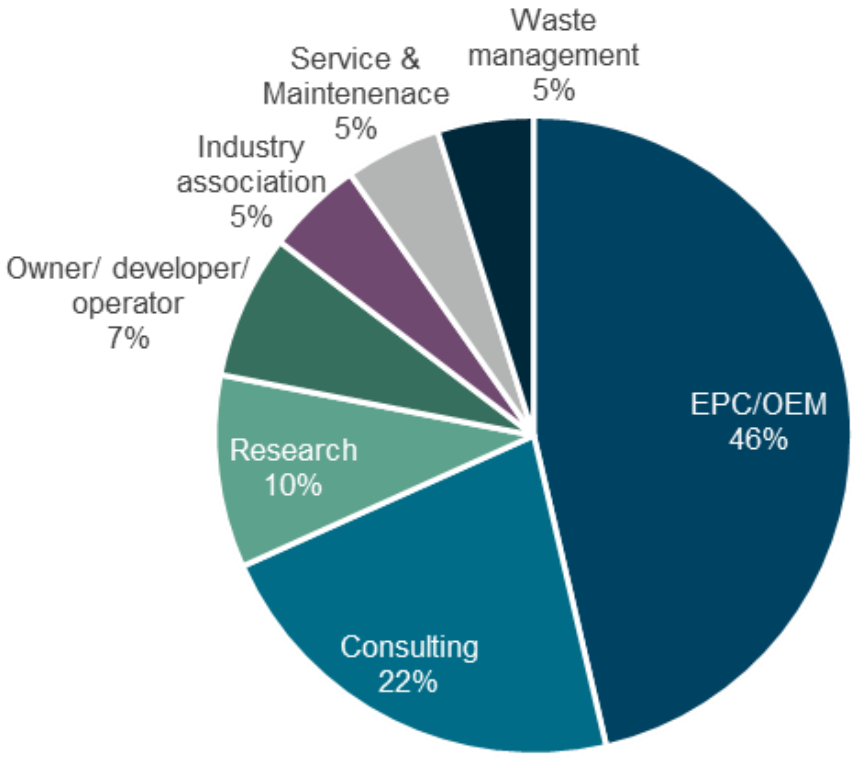
Scenario Planning

Scenarios are possible views of the world told in a story that gives a context to companies and individuals to make well informed decisions.

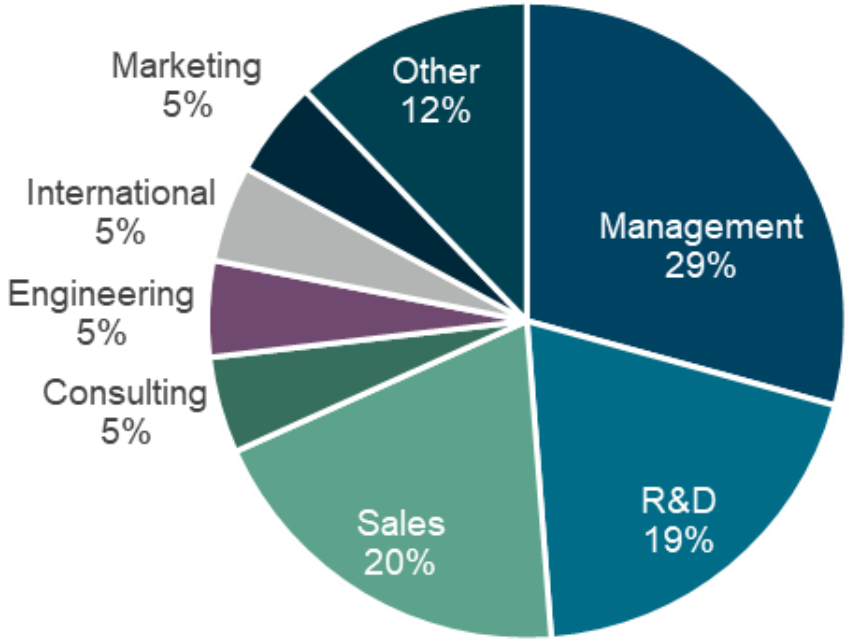
1. Help **take control** over the **uncertainty** by getting alternative views on future development
2. Highlight drivers of change to **manage complexity** of the environment
3. Assess **impact** of the crisis **on budgets** under different scenarios
4. Make **well informed decisions**
5. Develop a course of action that will be **sustainable in** any scenario
6. Develop a **winning strategy** for the new real

Profile of the Responses

Industry Segment



Job Function



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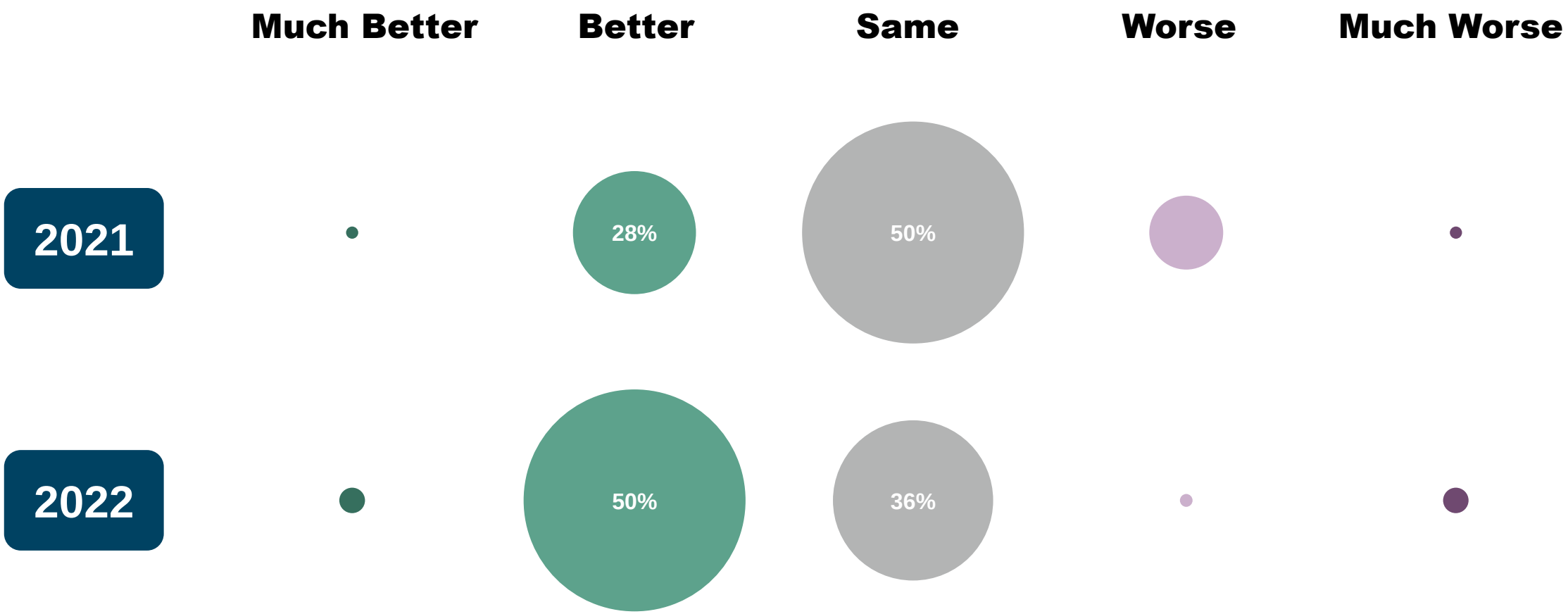
How respondents see their **business's prospects**



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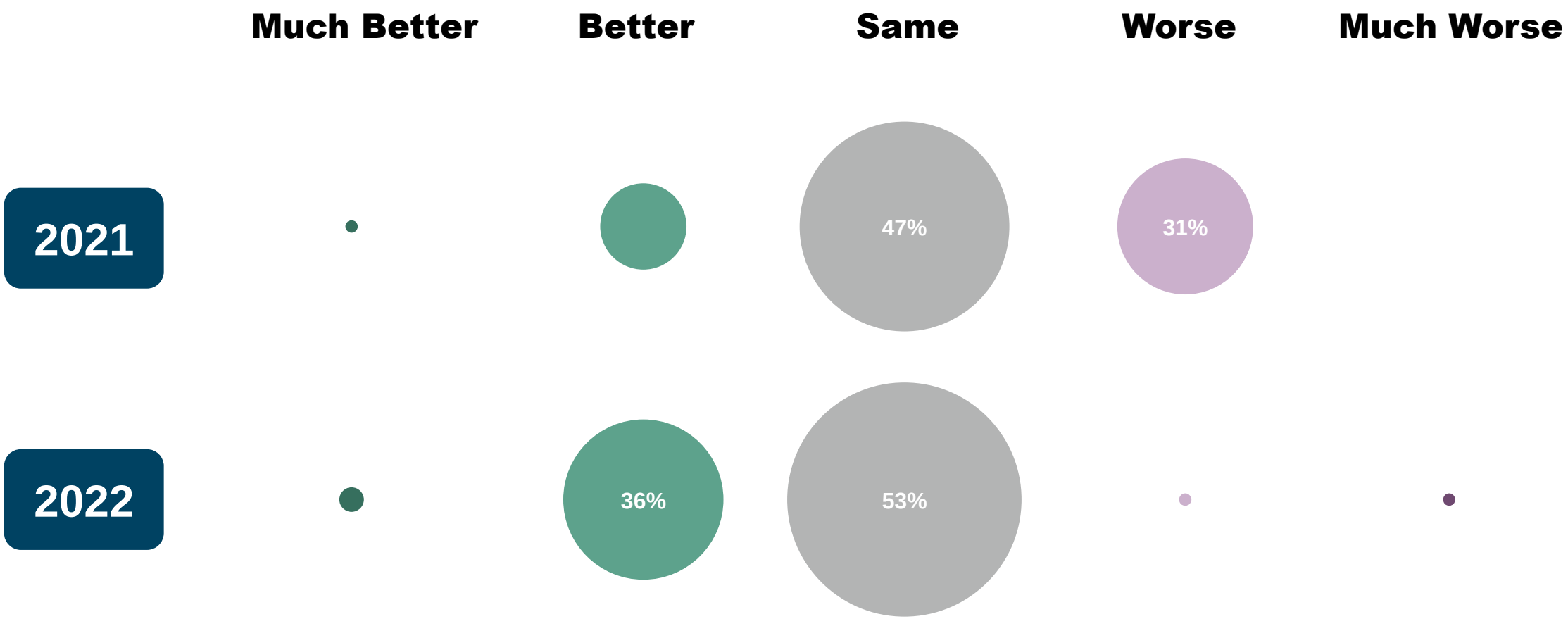
How respondents assess the **regional** market for **EfW**



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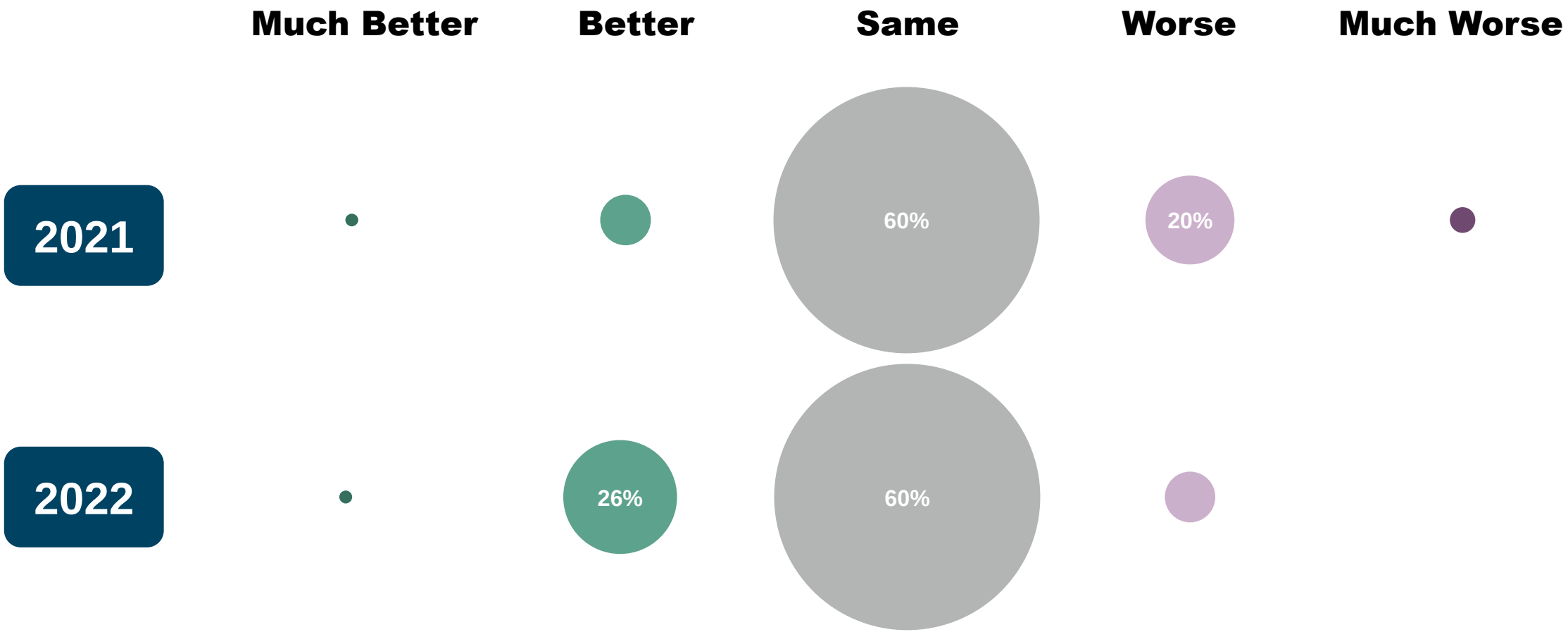
How respondents assess the **global** market for **EfW**



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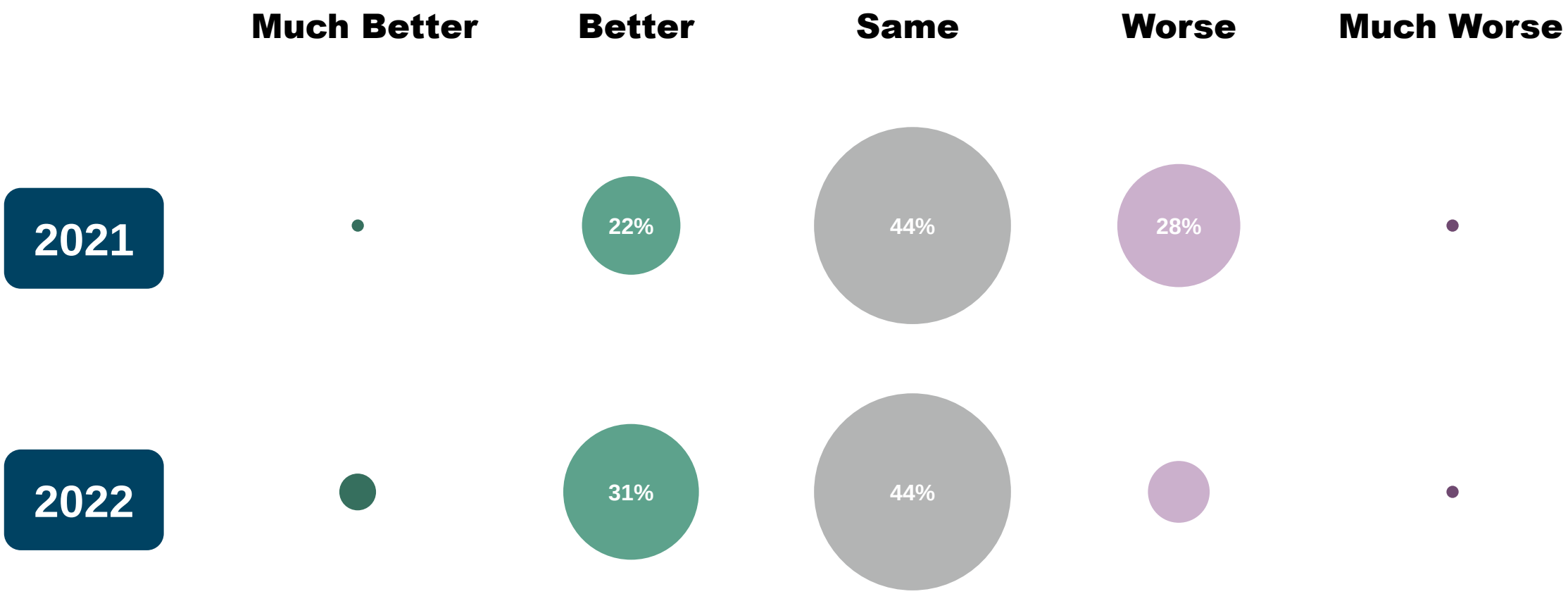
How respondents assess the **regional** market for **recycling**



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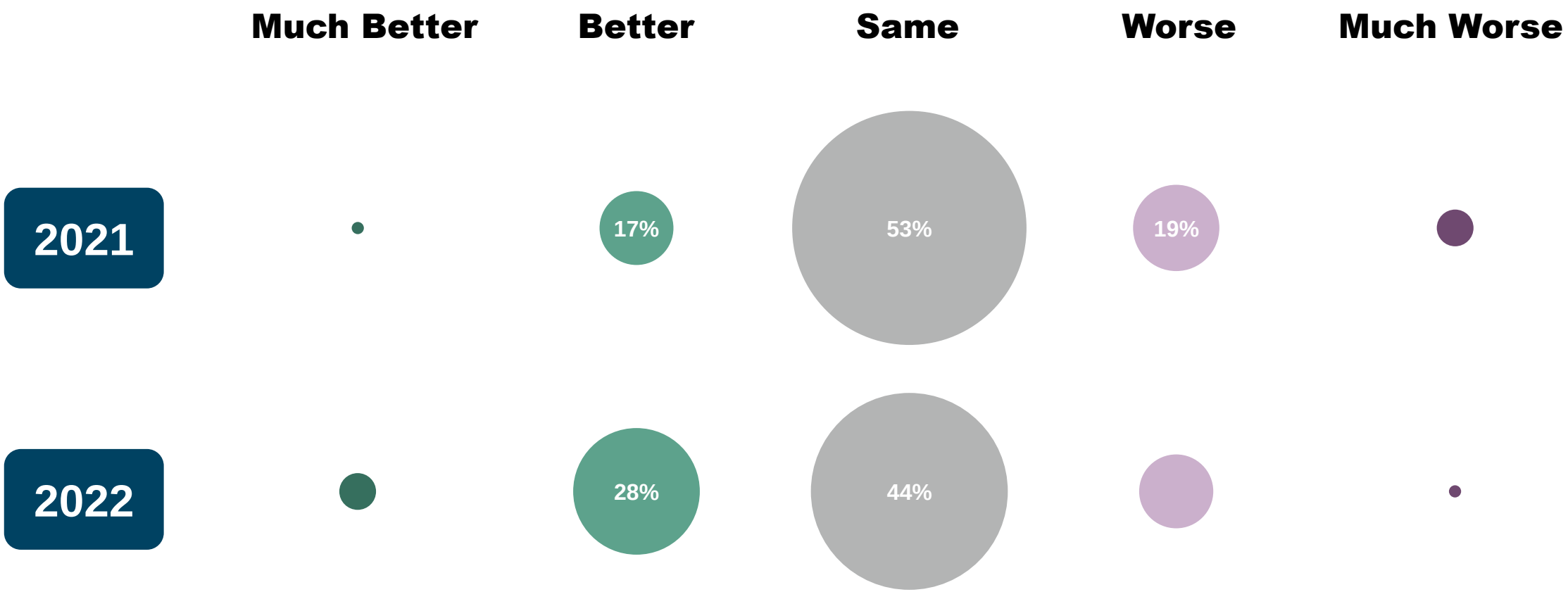
How respondents assess the **global** market for **recycling**



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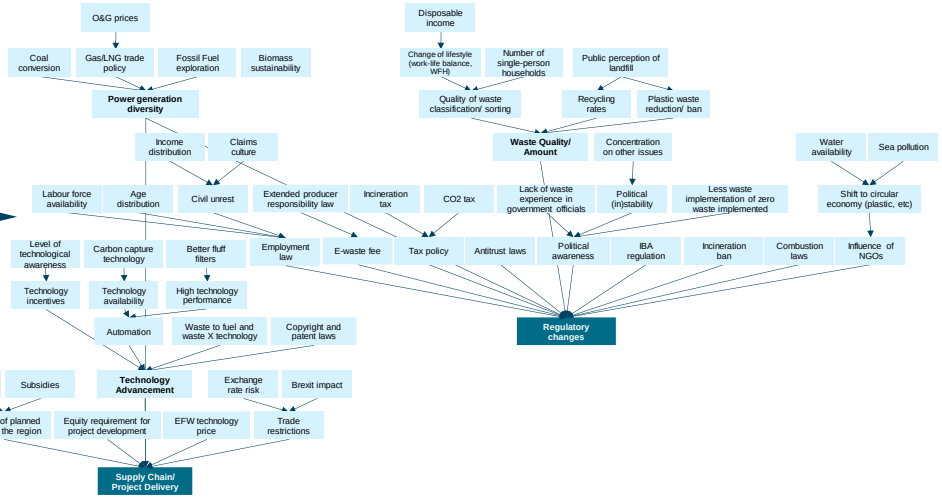
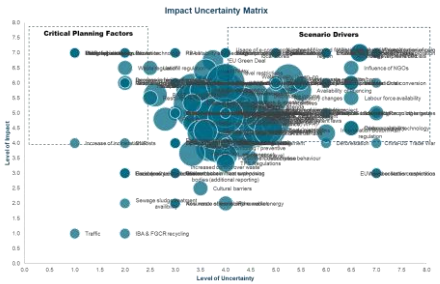
Research Uncertainties

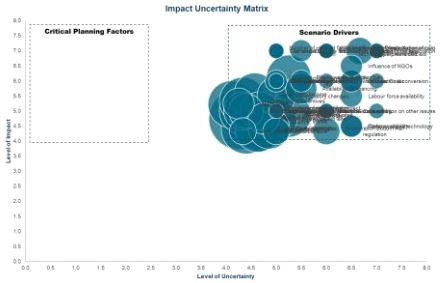
~600 PESTEL factors submitted

Grouped into ~200 common themes

>50 Critical uncertainties







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Post-COVID-19 Assumptions

	Assumptions
Economic Recession	• Reduced “industrial production” • Reduced energy need • High debt repayment
Circular Economy	• Re-use • Recycle
Climate Change Agenda	• CO_2 reduction • Renewable alternatives
Changes in lifestyle	• Increased working from home • Air traffic sustainable reduction • Focus on Health and Safety • Sanitation
Waste Volumes	• Reduced commercial waste • Less source separation and recycling • Increased residual waste / reduced waste quality

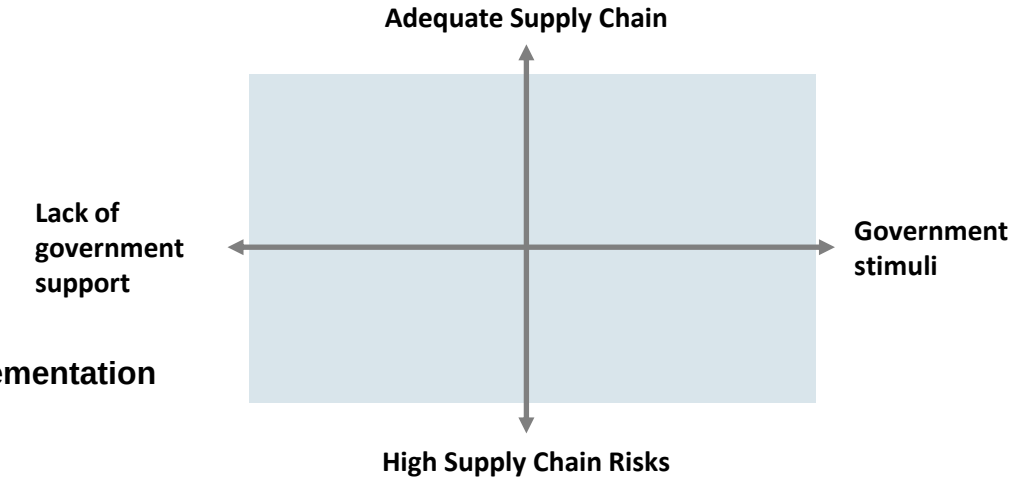
Key Critical Uncertainties

1 Government Stimulus

- ✓ **Enabling financial and regulatory incentives**
- ✓ **Dependent on**
  - ✓ Sustainability agenda
  - ✓ Renewable energy agenda
  - ✓ Pro-EFW political decision
- ✓ **Affect**
  - ✓ Regulatory framework
  - ✓ FIT, subsidies, other incentives
  - ✓ Laws in action: recycling, law
  - ✓ Waste management plan

2 Supply Chain

- ✓ **Enabling waste collection and project implementation**
- ✓ **Dependent on**
  - ✓ Waste management system
  - ✓ Viable project economics
  - ✓ Suitable/ acceptable technology
- ✓ **Affect**
  - ✓ Project bankability
  - ✓ Acceptable risk (EPC, Dev. company)
  - ✓ Private sector (dev. company) investment appetite
  - ✓ Infrastructure effectiveness



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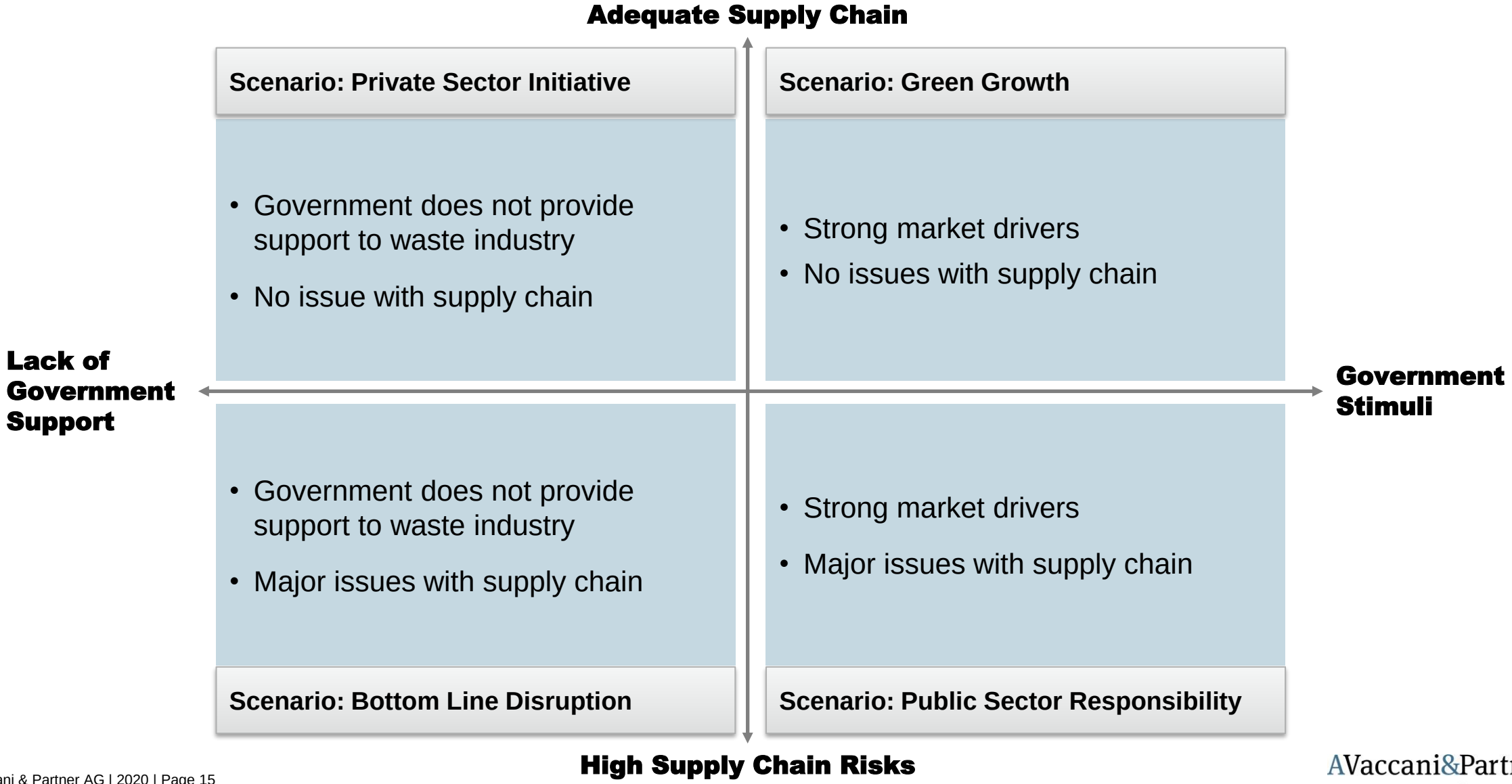
Post-COVID-19 Scenarios: EFW & Waste Management



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Post-COVID-19 Scenarios: EFW & Waste Management

Adequate Supply Chain

Scenario: Green Growth

Key Characteristics:

- Policy decision pro EfW
- Strong sustainability agenda
- Working laws, regulations, incentives, etc
- Economically viable projects due to gate fees, availability of financing, etc
- Strong and reliable developers, EPC, OEM, etc.

Risks:

- “Normal course of business”

Opportunities:

- For developers, investors, EPC, technology, etc.

Government Stimuli

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Post-COVID-19 Scenarios: EFW & Waste Management

Government Stimuli

High Supply Chain Risks

Key Characteristics:

- Strong government incentives
- Government stimuli to make up for supply chain links
- Missing links in supply chain
- Public ownership/financing

Risks:

- Developer risk (including country risk)

Opportunities:

- PPP / EPC
- Localize supply chain

Scenario: Public Sector Responsibility

Post-COVID-19 Scenarios: EFW & Waste Management

Scenario: Private Sector Initiative

Key Characteristics:

- Missing links in market drivers
- Insufficient incentives from the government
- Inadequate procurement process
- Smaller projects
- Preferred alternatives or the market is saturated

Risks:

- Project development
- Permitting
- Penalties (e.g. incineration /CO_2 tax)

Opportunities:

- Merchant facilities
- Decentralized solutions
- Innovation, alternative technologies (waste to X)

Adequate Supply Chain

Lack of Government Support

Post-COVID-19 Scenarios: EFW & Waste Management

Lack of Government Support

Key Characteristics:

- Lack of support and/or inadequate waste management system
- Bottom line optimisation
- Supply chain weak or inexistent
- Generally low market attractiveness
- Support toward alternative technology/segments (as opposed to EfW)

Risks:

- Lack of business opportunities
- Country risk
- Unfavourable project economics

Opportunities:

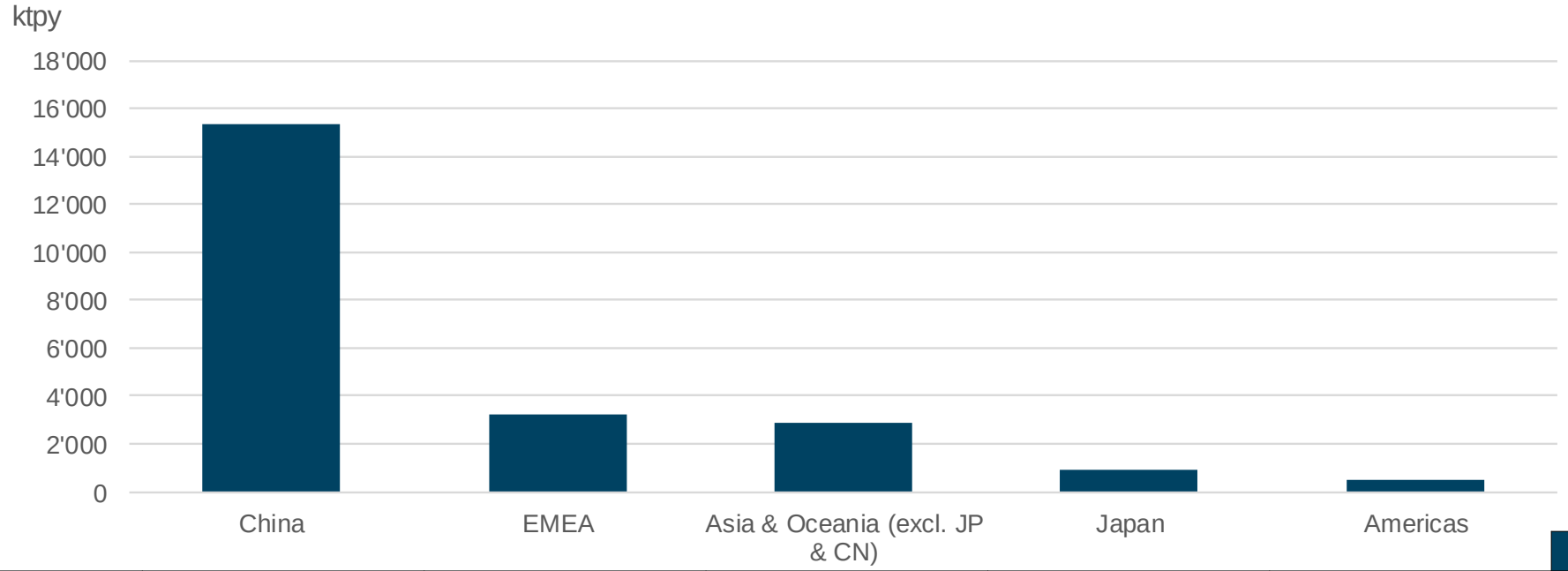
- Scientific landfill, recycling
- Education, market maker strategy
- Innovation and market disruptors

Scenario: Bottom Line Disruption

High Supply Chain Risks

Worldwide Annual Market Forecast by Region (2020 – 2024), ktpy

Annual Worldwide Market Potential for New Build is about € 9.2 Billion*, Highest Market Potential in China, EMEA, strongest growth SEA



						Total
Order ktpy	15’374	3’218	2’860	887	512	**22’851**
# of plants	59.4	18.0	13.3	9.0	2.7	**102.3**
M€	4’485	2’362	1’133	900	303	**9’183**

**** Forecast pre COVID-19 impact***

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Covid-19 Impact on the EfW Industry

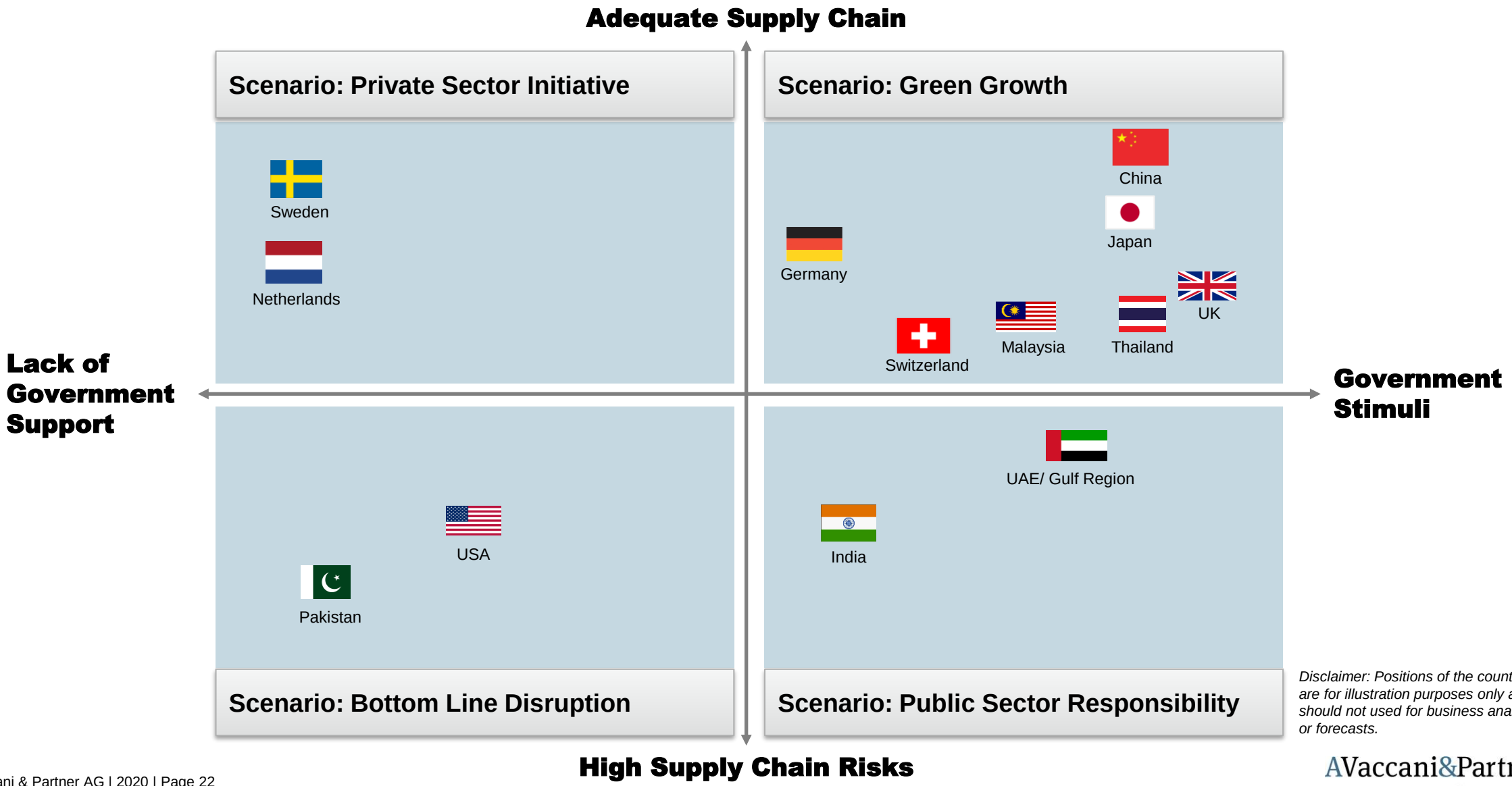
Developed markets with high EfW capacity

👎 **Pressure on market drivers**	Waste volume, private and public operator investment appetite and cost optimization programs
👎 **Pressure on project economics, e.g. gate fee**	Implementation pressure uncertainty, equity requirements, circular economy agenda

Markets with low EfW penetration and less developed waste management systems

👍 **Strengthening of market drivers**	Increased need for sanitation in urban environment, sustainability agenda of public and private sector
👍 **Implementation stimulation**	Economic support (green recovery), increased private sector involvement, PPP

Pre-COVID-19



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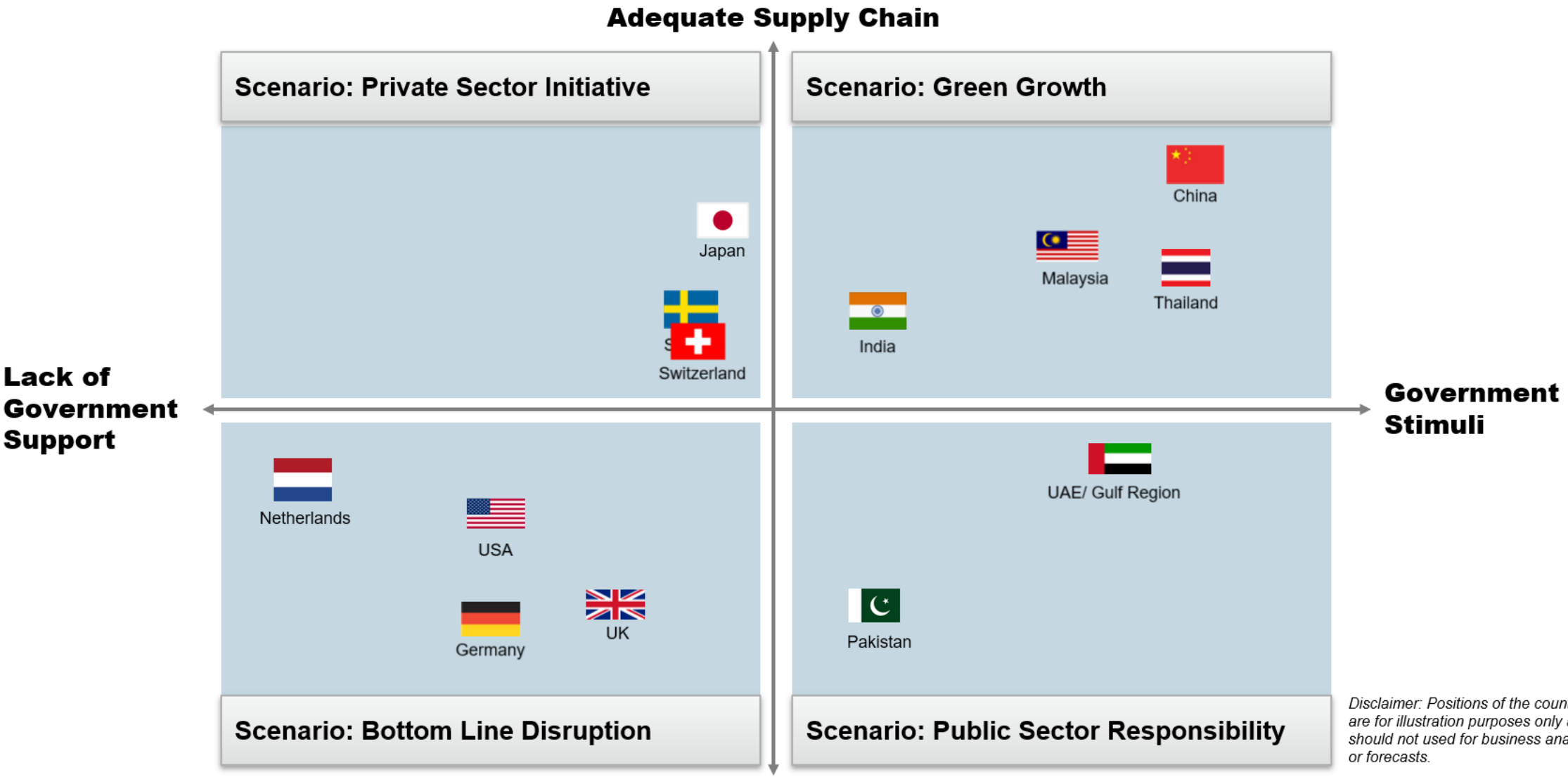
Post-COVID-19



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Final thoughts…

- Need for safe and sustainable waste management remains unchanged
- EfW has huge and sustainable long-term global market potential
- Individual market developments need to be watched carefully

➢ **AVP will present a scoring mechanism and a cockpit to better understand and track market developments… follow us on LinkedIn to stay updated**

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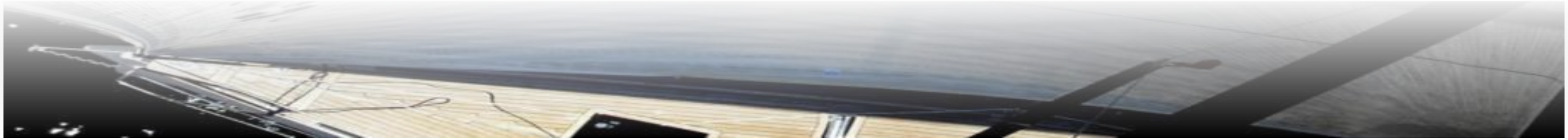
Thank you for your attention

– **2020 Edition Worldwide Market Share Analysis of Thermal Waste Treatment Plants**

Click for more information



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