

Corporate programs and sustainable innovation

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Cleantech Group's clients

We help leading corporates, investors, government agencies and funds engage with sustainable innovation

Investors & Banks

emerald Technology Ventures
TRUE NORTH VENTURE PARTNERS
PiperJaffray
CYCLE CAPITAL MANAGEMENT
Capricorn VENTURE PARTNERS
DeMeter PARTNERS
Chrysalix ENERGY VENTURE CAPITAL
svb Silicon Valley Bank
idinvest PARTNERS
BAIRD
Goldman Sachs

Government / Economic Development Agencies

INVEST IN ONLY LYON
CallaghanInnovation New Zealand's Innovation Agency
Flanders State of the art
Department for Business, Energy & Industrial Strategy
vito
Natural Resources Canada
Swedish Energy Agency

Service Providers

iea International Energy Agency
CHUBB
EPRI ELECTRIC POWER RESEARCH INSTITUTE
WSGR WILSON SONSINI GOODRICH & ROSATI
TaylorWessing

Accelerator / Incubator

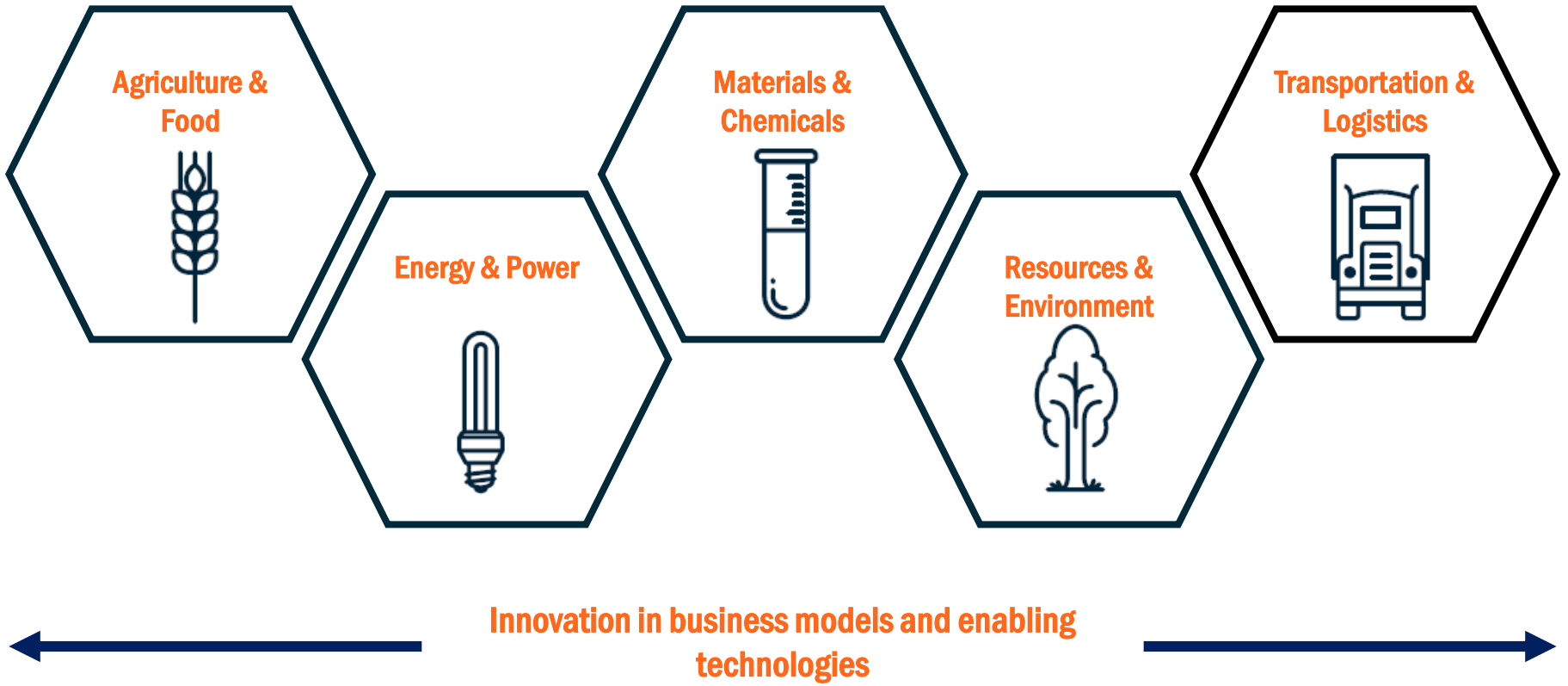
MaRS
kraftwerk city accelerator bremen
eit Climate-KIC
eit InnoEnergy Knowledge Innovation Community

Corporates

ENGIE
Sempra Energy
IBERDROLA
EDISON INTERNATIONAL
Origin energy
enel X
TOKYO GAS
Shell
TOTAL
上海电气 SHANGHAI ELECTRIC
bp
LG
LafargeHolcim
MITSUI & CO.
SIEMENS
سابك sabic
COX ENTERPRISES
SAINT-GOBAIN
ArcelorMittal
VEOLIA
SOLVAY
KURITA
DSM

Cleantech Group's coverage

Innovation to meet long-term energy security and climate goals



Corporate programs and sustainable innovation

Can there be mutual value creation? Does it move the needle for a cleaner economy?

- The typical corporate journey into external innovation
- A net positive for sustainable innovation?
- Strategies to help corporates maximize effectiveness of programs and impact of investments

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Why do corporates seek to engage external innovation?

1. Improve existing business, efficiency
2. Grow into new areas, convince new customers
3. License to operate - Respond to public pressure
4. Innovative image: recruitment, retention, etc.
5. Follow what their peers are doing

➢ Corporates are primarily profit-driven, not impact-driven

Innovation Tools: the typical corporate journey

Journey tends to start as opportunistic, then integrates learning and evolves

Engagement & new business team

- What: combines external engagement and new business
- Why: identify & engage companies: access to customers, technical support, project investment, direct investments
- Challenges: prioritizing, establishing network, building internal support, focusing on disruptive vs. incremental

Invest in VC Fund (LP)

- What: Allocate capital to external professionals
- Why: Exposure to companies, sector or geography
- Challenges: Management fees, carried interest, misaligned interest fund managers/exposure to innovation, meaningful access to companies, fund cycle



Own accelerator / challenges

- What: Systematic approach to attracting companies by offering range of support services
- Why: Enable interaction between companies, R&D and business units
- Challenges: Internal support, attracting the right companies, adding value, maintaining support services

Sponsorship – Academic, Incubator

- What: Sponsorship approach
- Why: Have visibility into emerging companies
- Challenges: low level of interaction with companies, multiple parties with different interest in same room

Direct investing: balance sheet and/or CVC

- What: Team of VC professionals to make equity investments
- Why: Exposure to companies, deal flow
- Challenges:, alignment with relevance to business units, deal approach to return on investment vs learnings, fit with business model (own company vs use service/product), timing

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Innovation Tools: the typical corporate journey

Constant tension between responding to current needs, and anticipating future ones

Incremental Innovation

- Solve specific business challenges
- Strong interaction with business units
- Easier to prove value and maintain funding
- Closer to purchasing than strategy



Disruptive innovation

- Prepares company for future environment
- Can create more sustainable business lines
- Harder to integrate with existing business
- Higher failure rate: harder to maintain

Innovation Tools: the typical corporate journey

Constant tension to justify money spent on innovation function

Financial return

- Easier to justify to CFOs
- Harder to achieve, VC is not an easy job
- Even if good returns, insignificant vs. corporate P&L



Strategic return

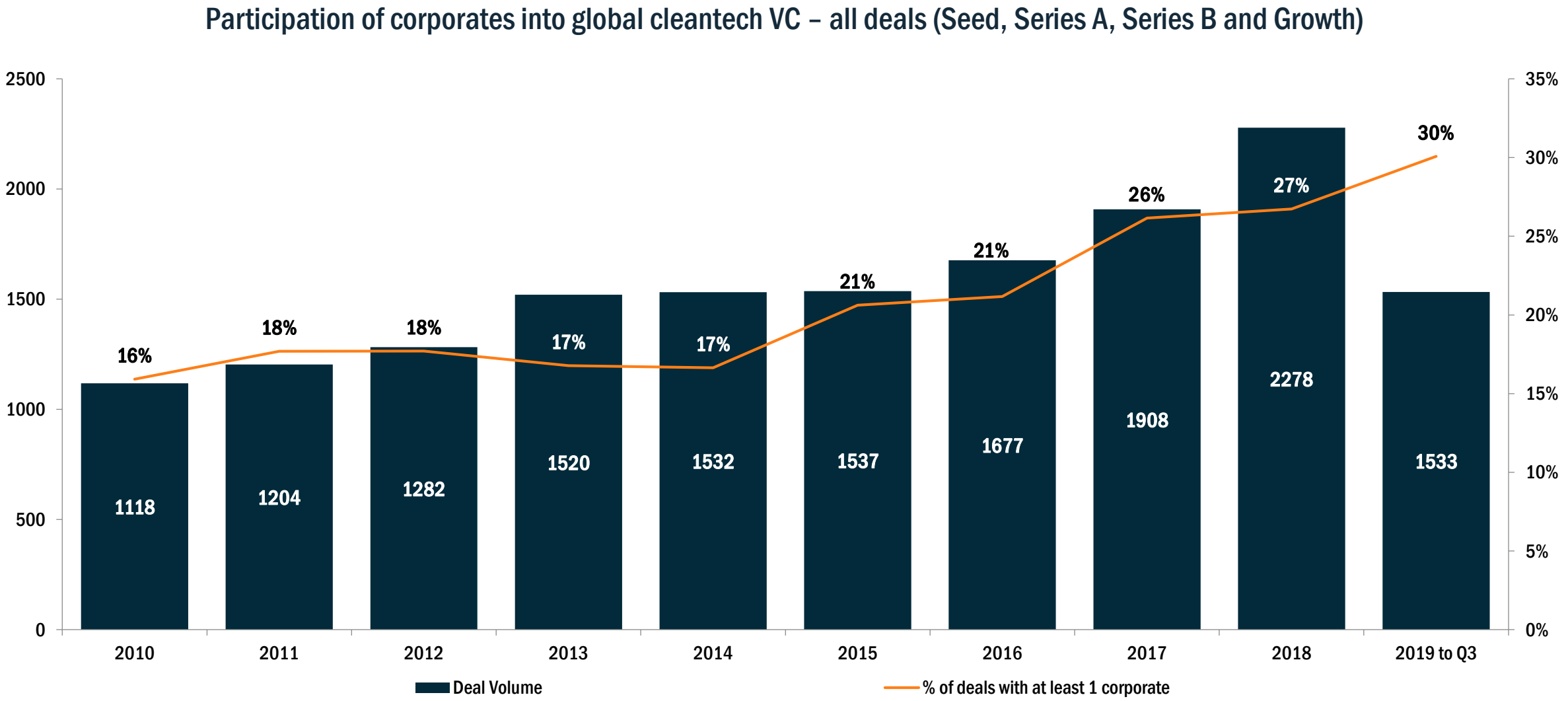
- Hard to achieve, requires deep change
- Harder to justify over time
- The only way to create lasting value

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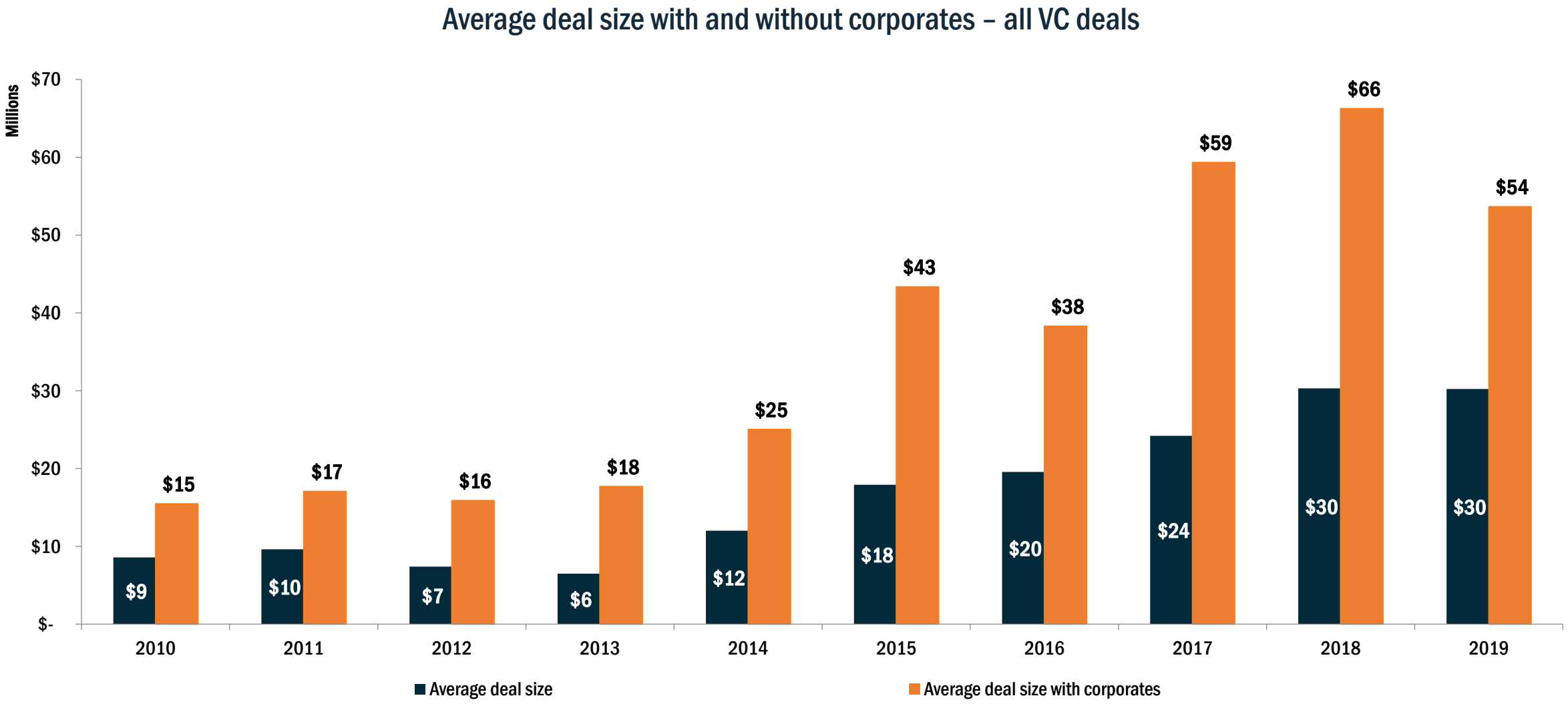
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- **A net positive for sustainable innovation?**
- Strategies to help corporates maximize effectiveness of programs and impact of investments

A driving force behind the rise of cleantech investment



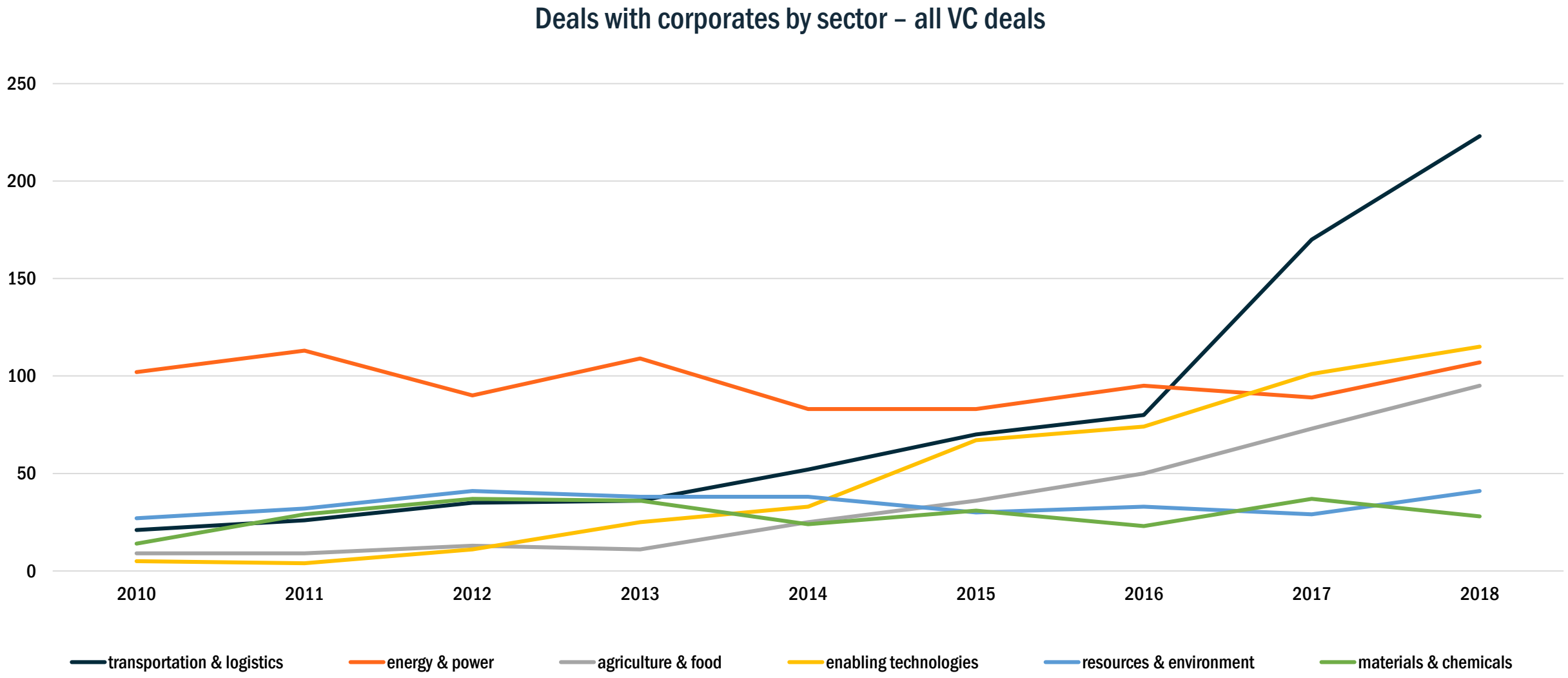
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A net positive for sustainable innovation?

A welcome bull in the china shop

Benefits

- Deep pockets
- Can test and validate technology
- Potential client / channel partner
- Strong validation signal
- Exit route

Drawbacks

- High Turnover in teams and strategy
- Drive bubbles and over-valuation
- Strategic value is hard to realize
- Journey from pilot to supplier is hard
- Acquisition can smother start-up business

- ➢ Significant investment into sustainable innovation
- ➢ Steep learning curve, some early interesting stories: Engie and Shell
- ➢ Environmental impact? Fleet electrification vs. digital technologies

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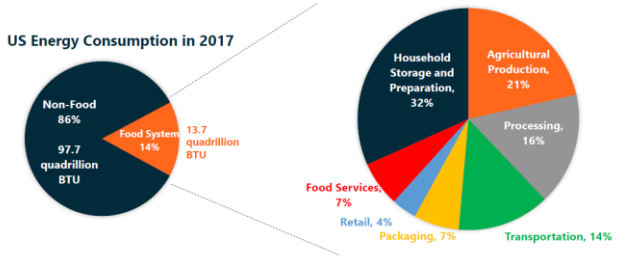
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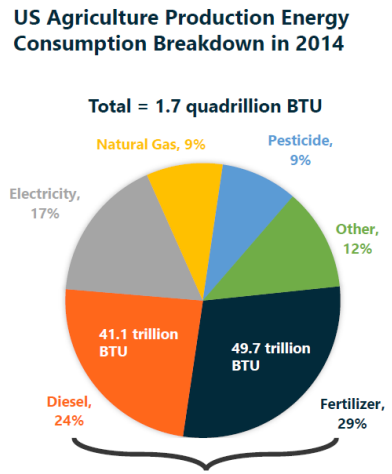
- The typical corporate journey into external innovation
- A net positive for sustainable innovation?
- **Strategies to help corporates maximize effectiveness of programs and impact of investments**

Strategy 1: Identify underfunded high-impact innovation

Challenge: Find investment areas that maximize energy, GHG and water impact for NREL and Wells Fargo fund

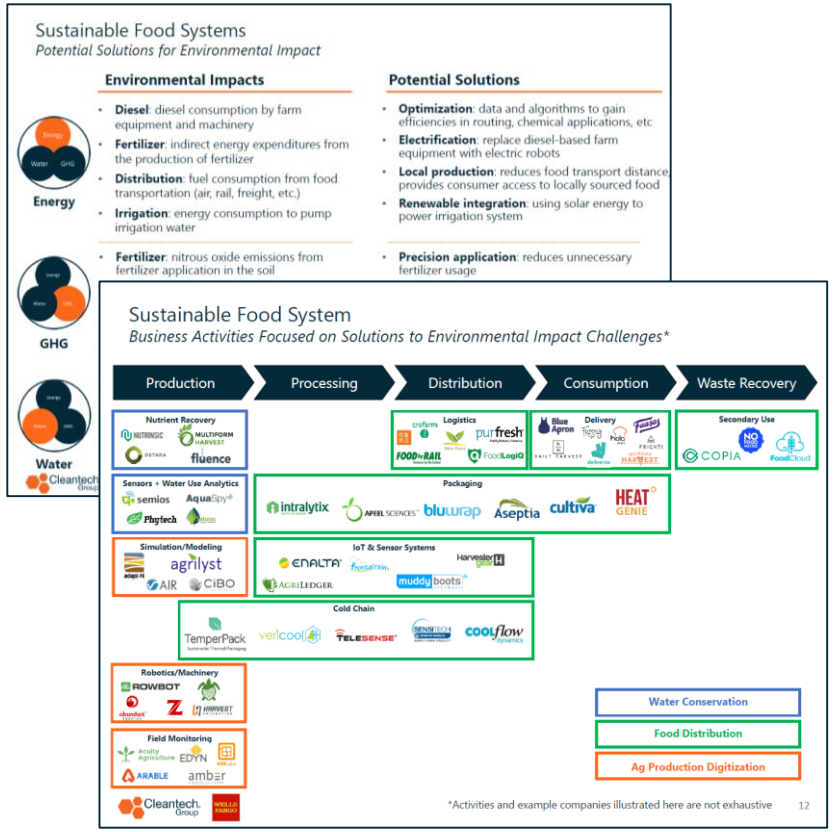
1 Understand where energy and resources are over-used



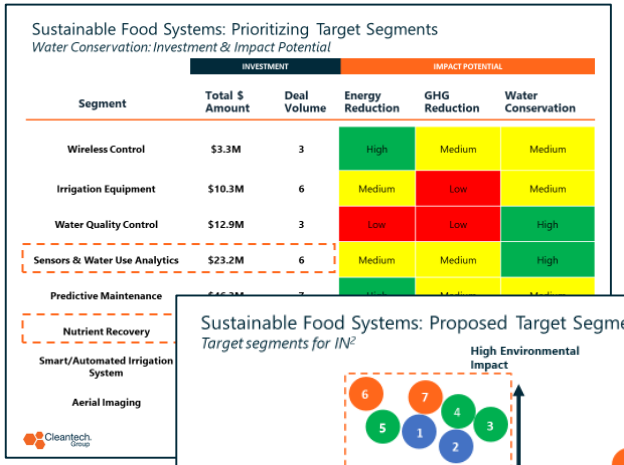


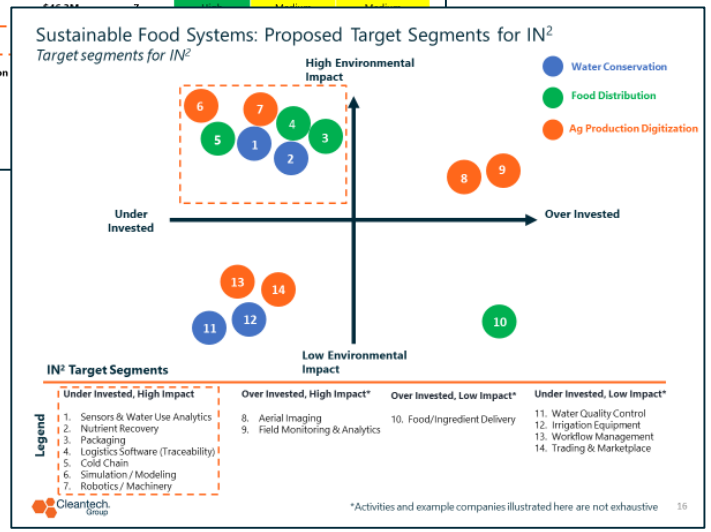
>50% of energy use is fertilizer and diesel usage

2 Build innovation landscape across the value chain



3 Pinpoint high-impact, underfunded segments for priority investment

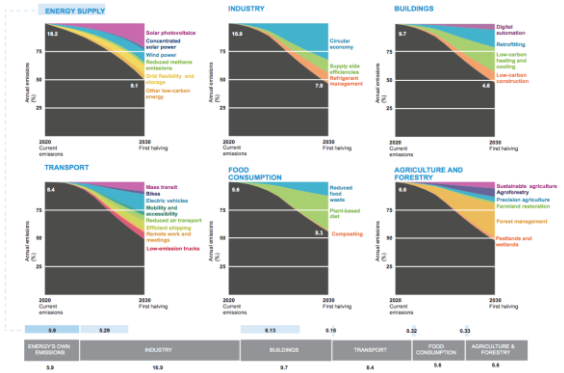




Strategy 1: Identify underfunded high-impact innovation

Challenge: Help corporates and governments identify the right segments to prioritize

1 Define high-impact areas with global research organizations



EXPONENTIAL ROADMAP

Rank	Solution	Sector	TOTAL ATMOSPHERIC CO2-EQ REDUCTION (GT)	NET COST (BILLIONS US $)	SAVINGS (BILLIONS US $)
1	Refrigerant Management	Materials	89.74	N/A	$-902.77
2	Wind Turbines (Onshore)	Electricity Generation	84.60	$1,225.37	$7,425.00
3	Reduced Food Waste	Food	70.53	N/A	N/A
4	Plant-Rich Diet	Food	66.11	N/A	N/A
5	Tropical Forests	Land Use	61.23	N/A	N/A
6	Educating Girls	Women and Girls	51.48	N/A	N/A
7	Family Planning	Women and Girls	51.48	N/A	N/A
8	Solar Farms	Electricity Generation	36.90	$-80.60	$5,023.84
9	Silvopasture	Food	31.19	$41.59	$699.37
10	Rooftop Solar	Electricity Generation	24.60	$453.14	$3,467.63
11	Regenerative Agriculture	Food	23.15	$57.22	$1,926.10
12	Temperate Forests	Land Use	22.61	N/A	N/A
13	Peatlands	Land Use	21.57	N/A	N/A
14	Tropical Staple Trees	Food	20.19	$120.07	$626.87
15	Afforestation	Land Use	18.06	$29.44	$392.33
16	Conservation Agriculture	Food	17.35	$37.63	$2,119.07
17	Tree Intercropping	Food	17.30	$146.99	$22.10
18	Geothermal	Electricity Generation	16.60	$-155.48	$1,024.34
19	Managed Grazing	Food	16.34	$60.48	$735.27
20	Nuclear	Electricity Generation	16.09	$0.88	$1,713.40
21	Clean Cookstoves	Food	15.81	$72.16	$166.28
22	Wind Turbines (Offshore)	Electricity Generation	14.10	$545.30	$782.50
23	Farmland Restoration	Food	14.08	$72.24	$1,340.47
24	Improved Rice Cultivation	Food	11.34	N/A	$519.06
25	Concentrated Solar	Electricity Generation	10.90	$1,319.70	$413.85
26	Electric Vehicles	Transport	10.80	$14,148.00	$9,726.40
27	District Heating	Buildings and Cities	9.36	$457.10	$3,543.50
28	Multistrata Agroforestry	Food	9.28	$26.76	$709.75

PROJECT DRAWDOWN

2 Identify innovation segments within these high-impact areas

High-Impact Areas	Examples of Early-Stage Innovation Areas	
	Technology	Business models
Heating & Cooling	Water-based cooling	
Wind Turbines (Onshore)		
Reduced Food Waste	Grain moisture sensors	Dynamic pricing based on shelf life
Plant-Rich Diet	Upcycled proteins Plant-based meat alternatives	
Family Planning		
Solar Farms		Crowdfunding
Rooftop Solar		Energy Access as a Service
Regenerative Agriculture	Biochar	Community farming
Peatlands		
Afforestation	Tree sleeves Satellite imagery	Biodiversity credits
Nuclear	Modular Fusion	
Clean Cookstoves	Electric Biomass	Lease-to-Own
Energy Storage	Long-term storage New chemistries	VPP
Electric Vehicles	Solar vehicles	Shared EVs
Insulation	Glass Retrofits	As a Service

3 Surface early-stage companies developing the best solutions to solve challenge



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Strategy 2: Value chain cooperation

Challenge: Help a global cement corporate develop a program to support R&D sustainability objectives

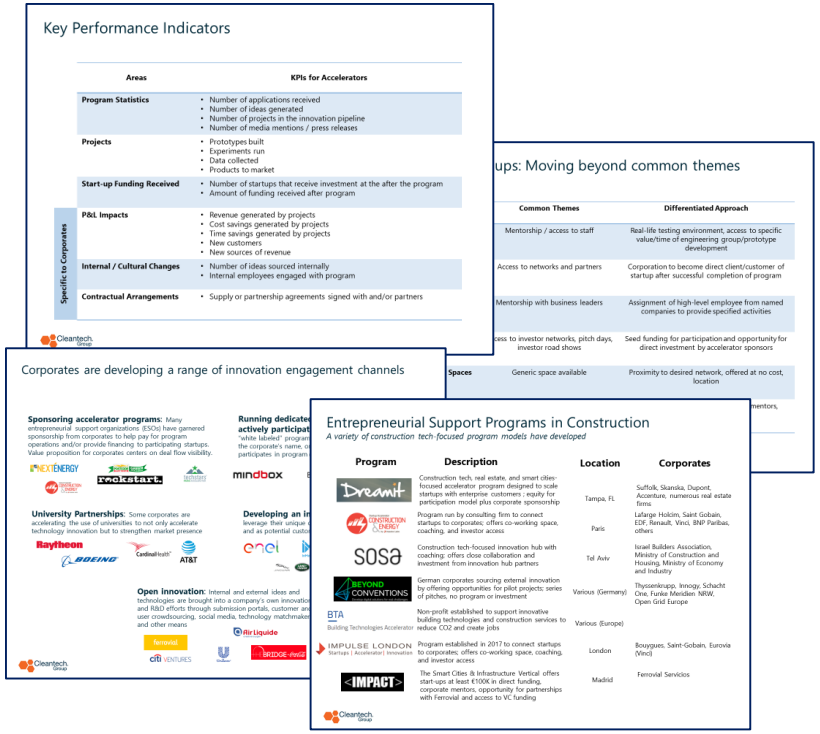
1 Put together a group of corporates active in the same value chain



2 Optimize structure for strategic return: skin in the game from BUs, innovation-led team

- How to capture value?
- What are the key activities?
- What are the roles and responsibilities?
- What is the business plan : Budget? Funding? Timeline? Capital Participation?
- How will knowledge be captured?
- Should staffing come from the company, partners, new hires or subcontractors?
- How to support them through stages?
- How to engage with the market landscape and ecosystem?
- How to maintain and evolve the program?

3 Design an accelerator program with a strong value proposition and maximize recruitment



Strategy 3: Build a clean business from scratch

Challenge: help a private $20b diversified company define and create a new business vertical around cleantech/sustainability “. Leave the world a better place with specific revenue goals.

1

Define scope, opportunity and relevant taxonomy



2

Prioritize sectors and segments based on attractiveness, competitiveness and feasibility

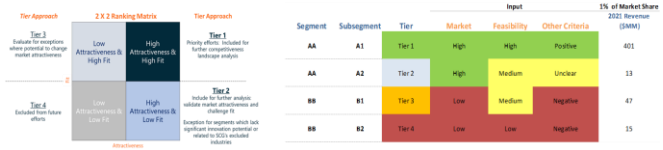
Landscape

- **Overview:** provides a description of the target markets, key trends, forecast, drivers, risks & barriers
- **Value Chain:** describes the key activities within the market e.g. manufacture, develop & service; also includes market size, and definition of opportunity. Identification of subsegments of interest

Market & Feasibility

- **Business Activity:** description of how specific key companies provide value and earn economic rent across the value chain through technology / business model.
- **Competitive Threat Assessment:** description of threats to market entry using Porter's Five Forces framework (New Entrant, Supplier Power, Substitutes, Rivalry & Buyer Power)
- **Score:** Evaluation of Market and Feasibility to prioritize sub segments by Tier

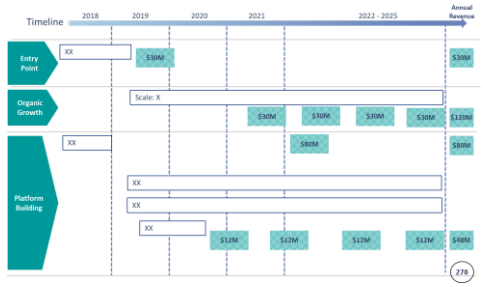
Provide inputs to prioritization matrix



3

Options for creating a $2-10b platform of attractive clean businesses





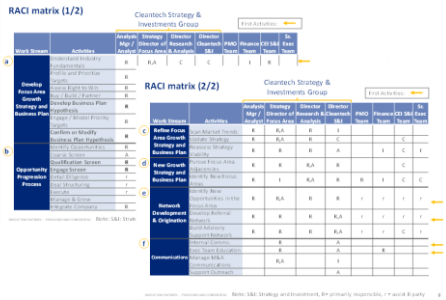
4

Build supporting organization and roles

Organizational structure and work streams



Work streams, Activities and RACI matrix



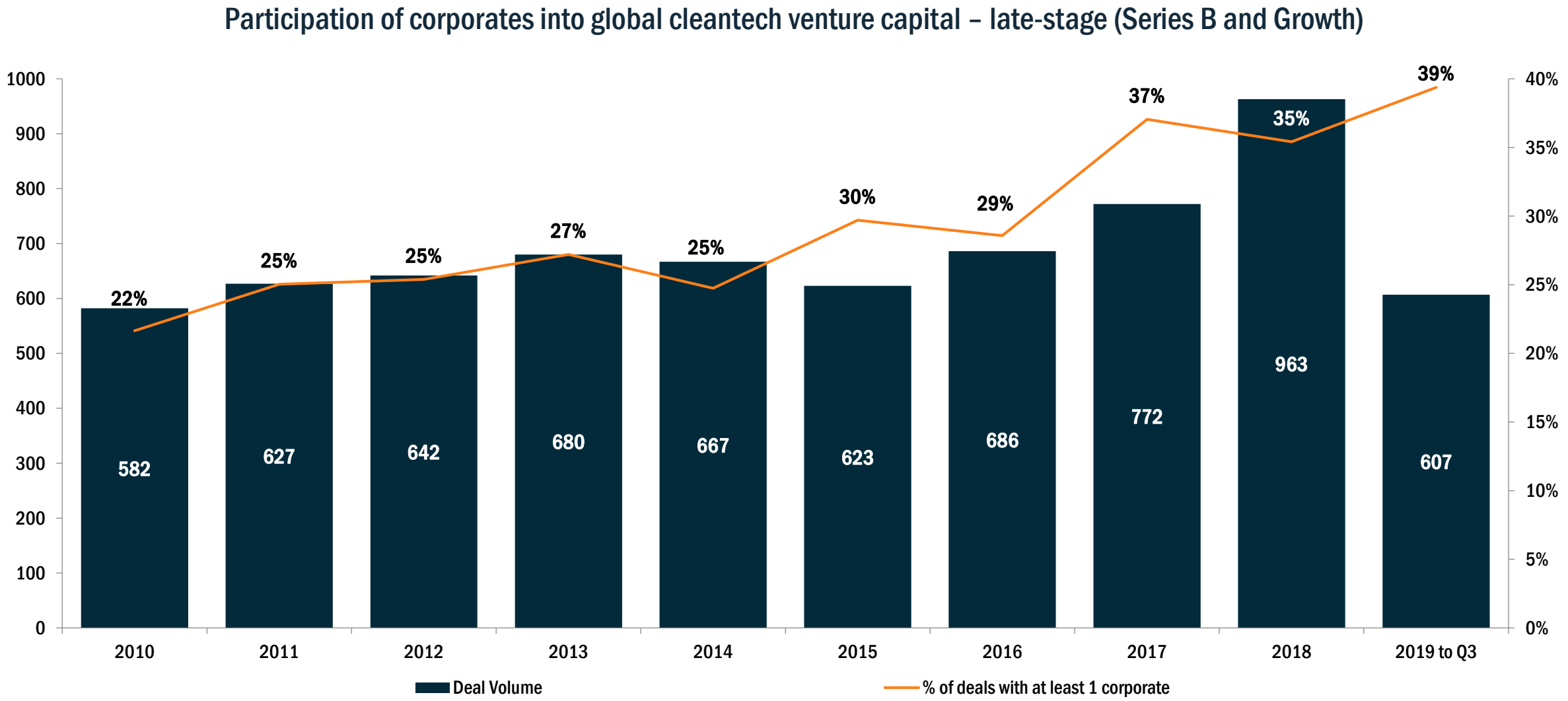
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Questions?

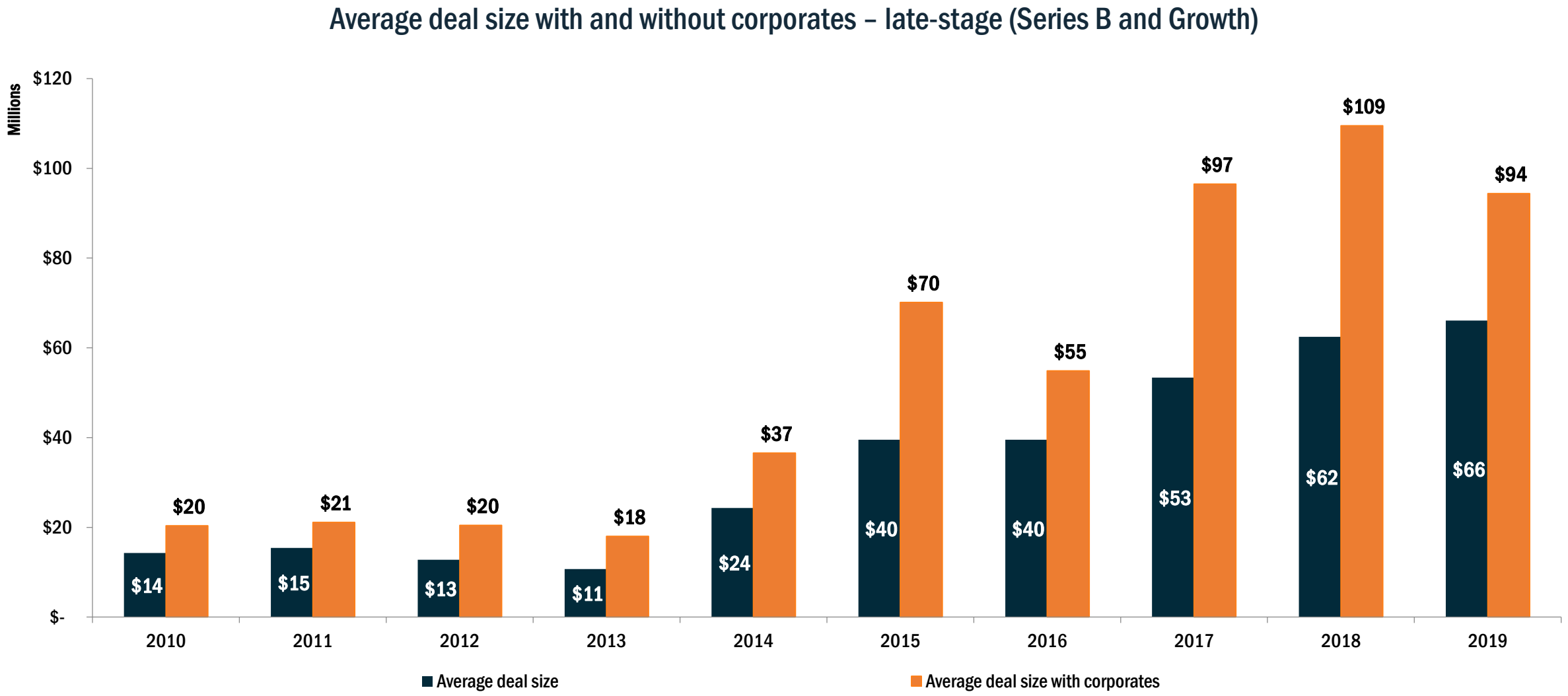
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A driving force behind the rise of cleantech investment



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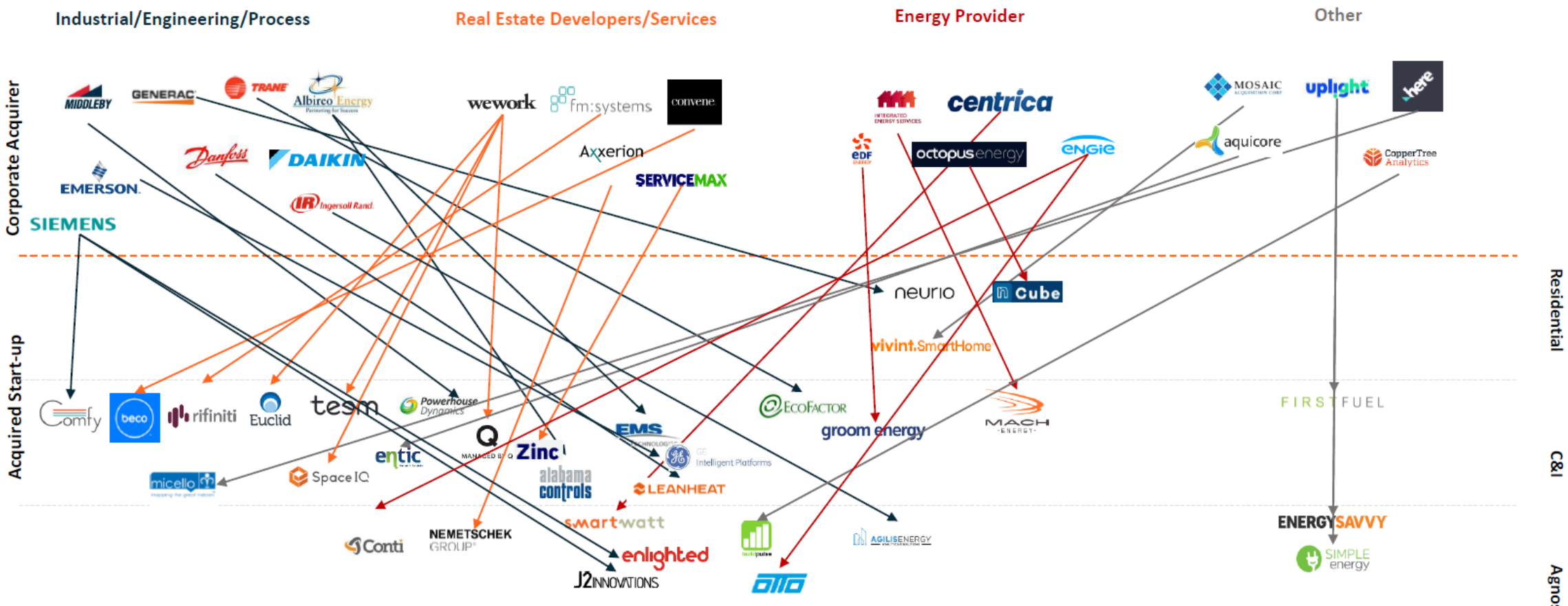
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Acquisitions in the Building Automation space – 2018-19



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