

Innovative Routes Via Mergers & Acquisitions in Europe, Asia, Middle East and the Americas (for UK Firms)

John Marcantonio CCD Partners

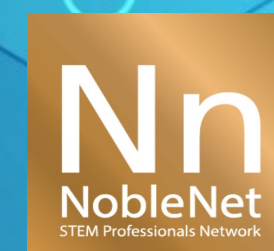
Stage 5 at 14.30 hrs

NobleNet

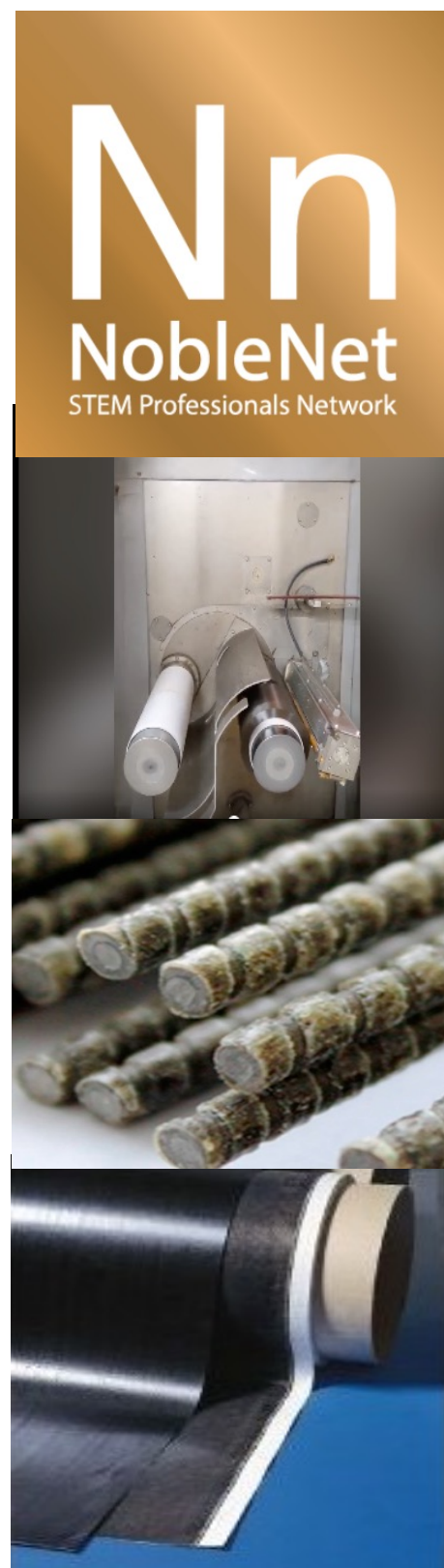
ChemUK - Thursday 11th May 2023



Insight | Network | Execution
www.ccdpartners.com



Agenda



Revisiting Industrial Innovation

This presentation covers CCD Partners' analysis of European commercial and technical trends in the specialty chemicals, bio-intermediates and engineering polymer value chains for SMEs.

It covers how the increase in Mergers & Acquisitions (M&A) and commercial innovation activity are affecting EU markets. The themes cover:

0. Background
1. Economic & Legislative Trends (Selective M&A)
2. Perceived Market Values of Innovation – rationale & positioning
3. Resource Constraints & TRL Levels
4. Partnership via M&A or technology start-ups experiences to date.
Foreign Direct Investment (FDI) versus geographical reach

Foreword

The world is experiencing an explosion of innovation and market disruption across multiple fronts: the transition to the circular economy, improving environmental standards, personal and AI-driven healthcare, renewable energy, and more....

New technologies, routes to market, and consumer preferences are re-working the supply chains of global chemicals and life sciences industries.

CCD Partners was founded to solve the unique challenges faced by the business leaders and investors driving and navigating these changes.

We are proud to be playing a small yet meaningful role in accelerating progress and enhancing the human condition.



30+

multi-disciplinary
senior advisors

20+

live projects
in chemicals and
life sciences *per
annum*

My Background ?

Theory of Innovation

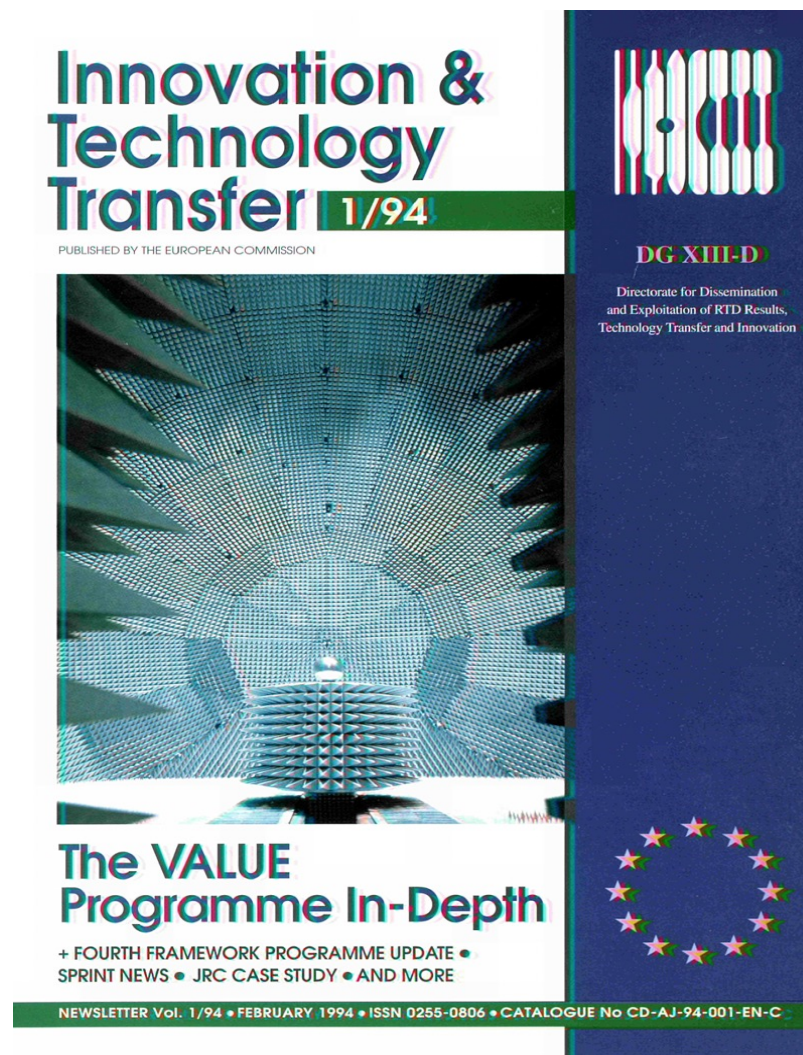


Director of SPRU, the late Prof. Christopher Freeman

Freeman pioneered the future of innovation & study development e.g. key DG XII & DG XIII Doctrines that radical Innovation drives the economy forward. Later changed to Social Impact of Innovation as seen in 2020-30.

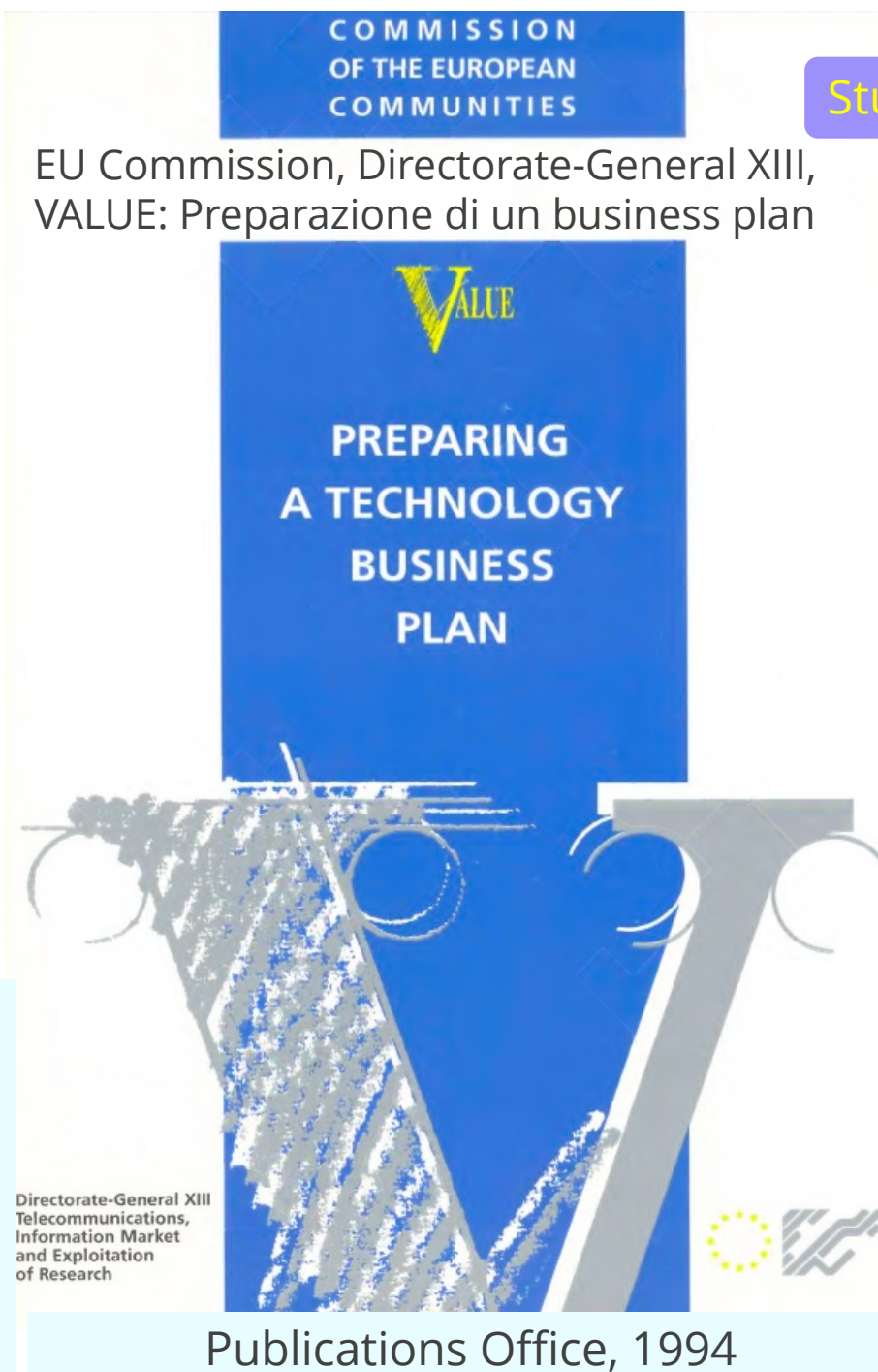
My tutor in 1980-81
Part of Chemistry with Econs.

Observing SME Innovation



DG XII & DG XIII Industrial Innovation Framework Programmes
My Participation 1987 to 1999 as "Scientific Expert" or Evaluator of R&D e.g. Brite, Euram, Value etc., now CORDIS & Horizon 2030

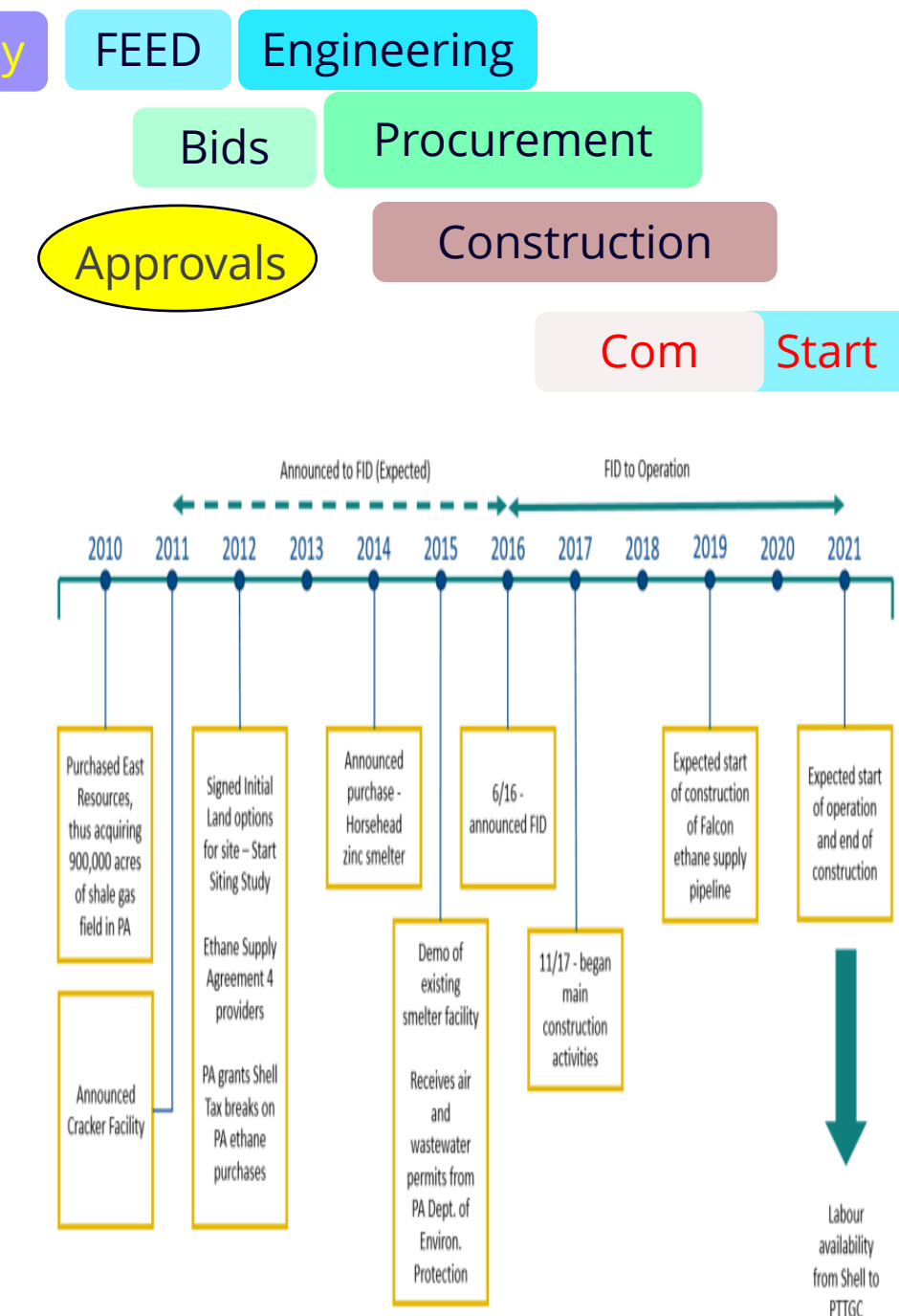
Innovation Training



EU Commission, Directorate-General XIII, VALUE: Preparazione di un business plan

Publications Office, 1994

Big EPC Project Schedules



My Background ?

Theory of Innovation

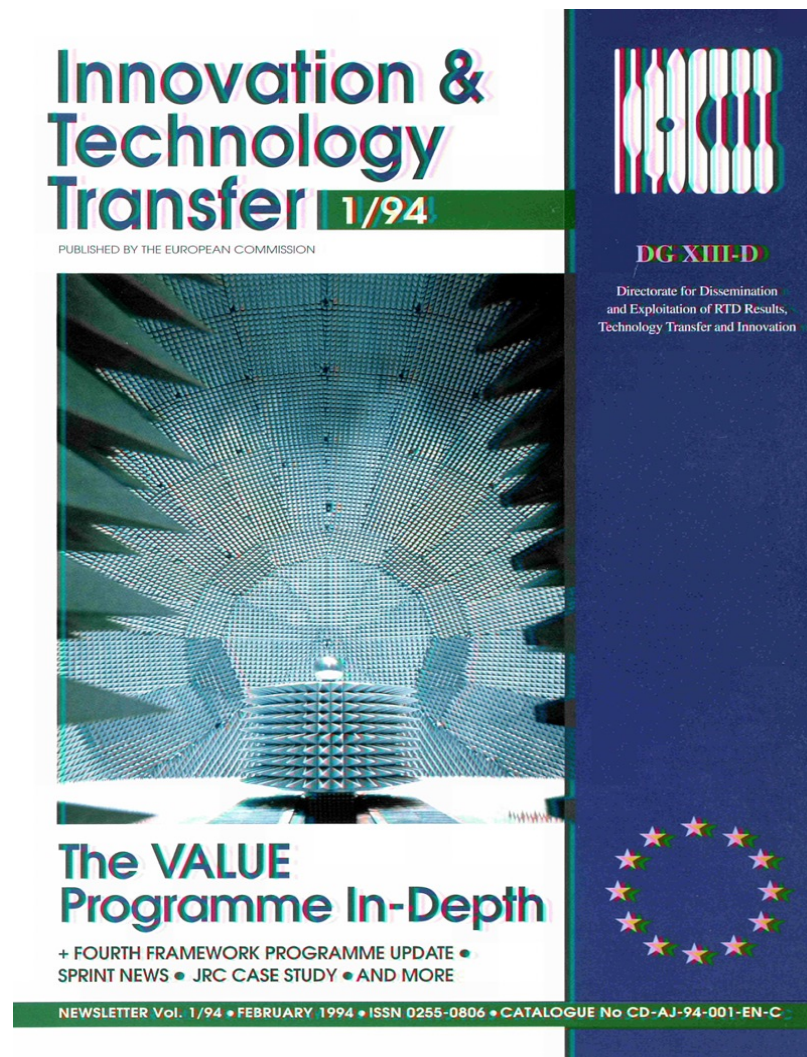


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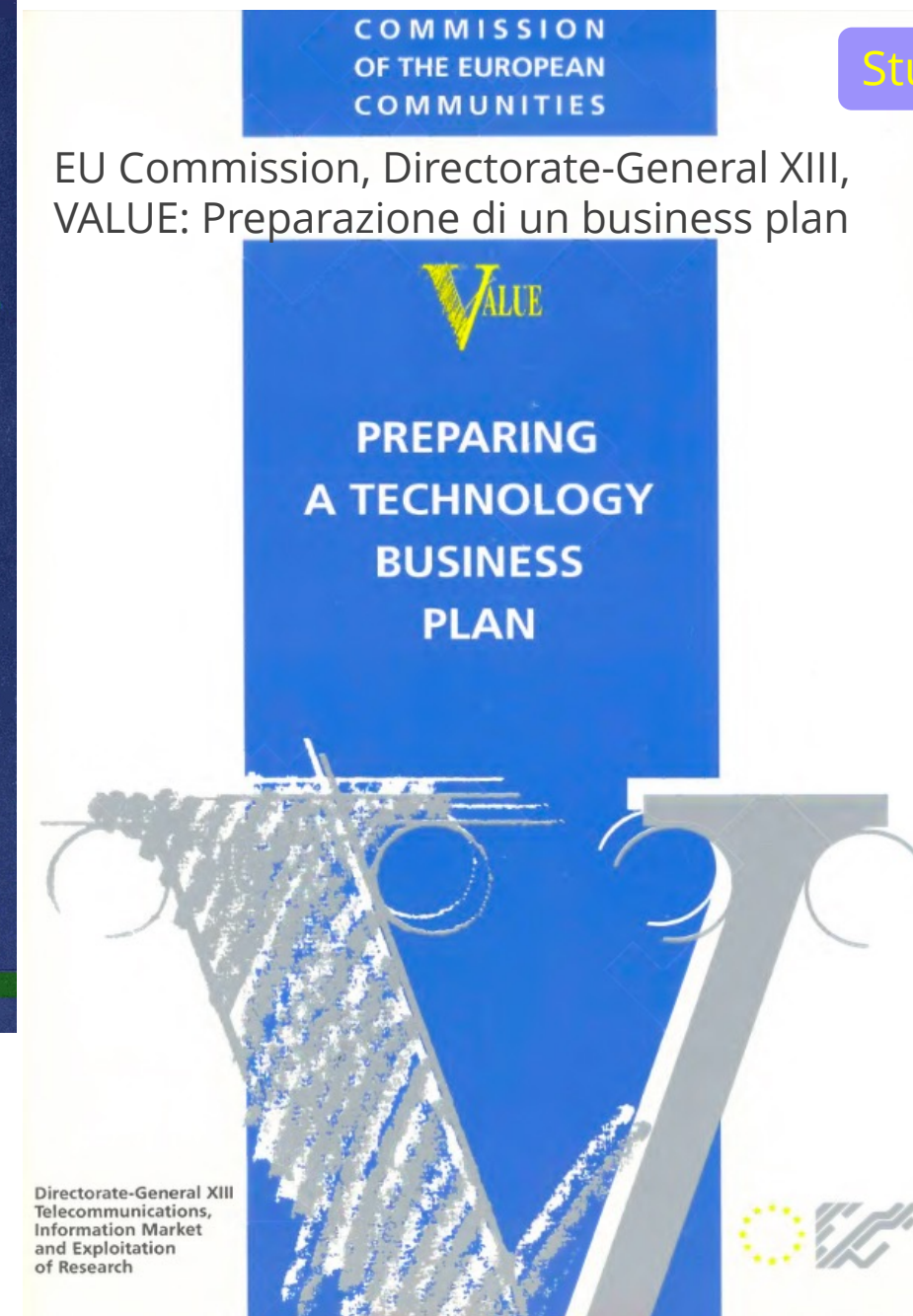
1960s -70s

Observing SME Innovation



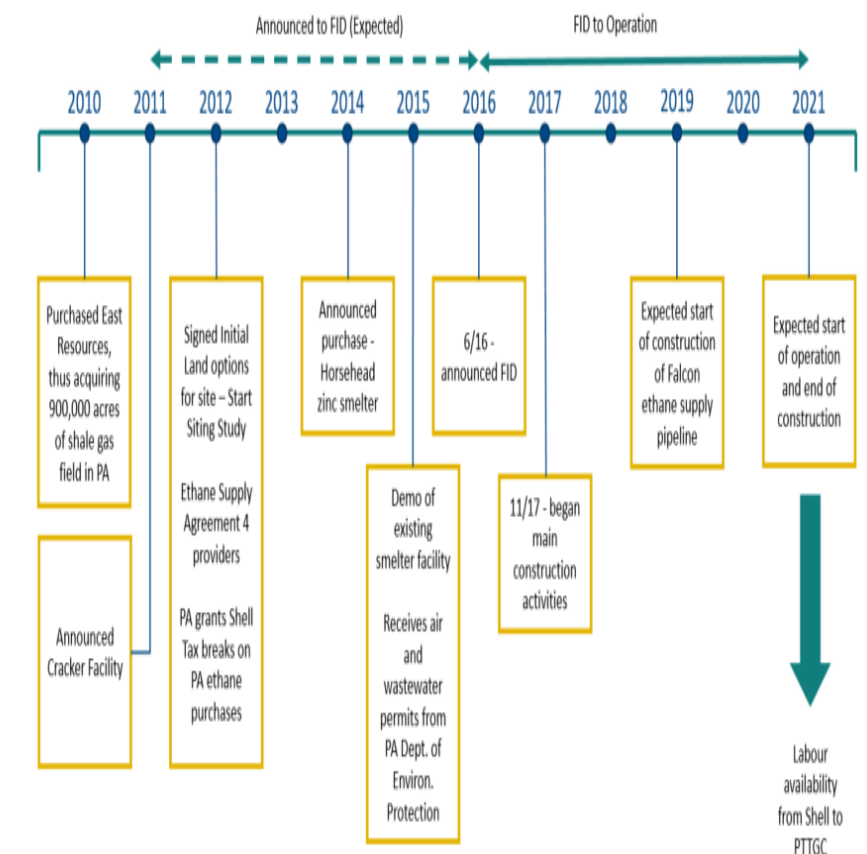
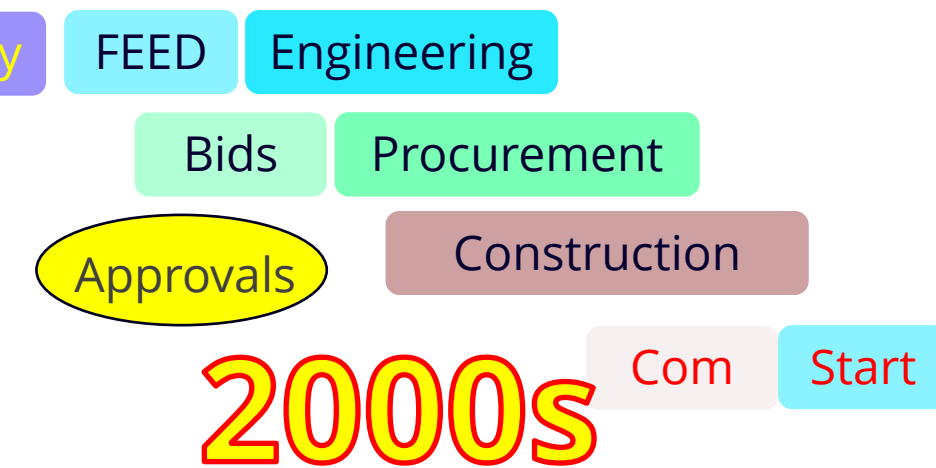
1980s

Innovation Training



1990s

Big EPC Project Schedules



2010s

Selected 2023 Trends

Confused Picture on GDP Growth Rates By Month, by Quarter, by Region and by Country including:



Different Economy recovery rates to continue.



China wages at \$8/hr. now 3 times India & 2.5 times that of Mexico.
Chemical FDI approach changes anticipated.



“Reshoring” after COVID & Ukraine War Gas Hike. *Stronger regional drive for R&D e.g., IRA in US.*



High Inflation remains & Interest rates rising to “crush it”.
Chemical Pricing no longer transparent.



Chemical Industry currently pre-occupied with:

- 2030 emission goals starting with Scope 1 and 2.
- Sustainability of asset portfolios → acquire/ exit/ de-risk?
- Carbon footprinted Supply Chains
- Digital offerings



**M&A offers an option
to the 2030 timing
problems**



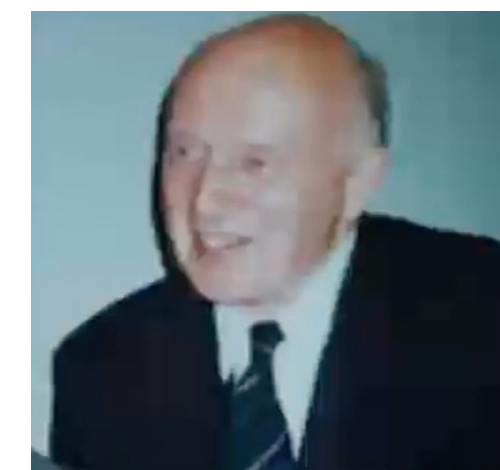
Schumpeterian Economic Theory and its Influence on Industrial Innovation ..?

Key Points

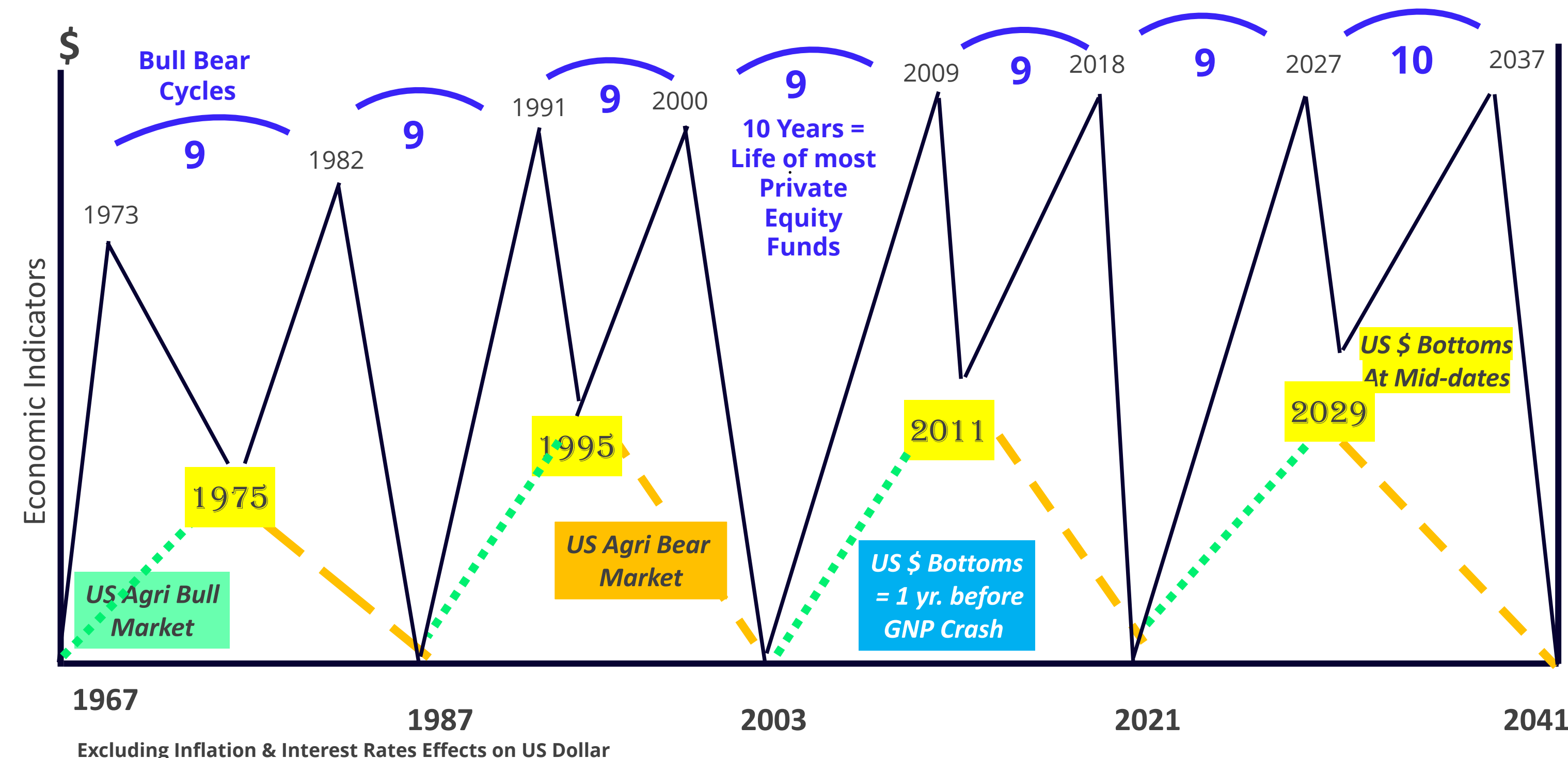
Farmer Benner
Focused on US
Agriculture

Assumes No
Catastrophic Events

Does Not Cover
Serious Short-Term
Noise nor
Devaluations



Freeman Built on
Joseph Schumpeter's
Idea that New/
Disruptive but Applied
R&D i.e. 1980s
Industrial Innovation
could counter
downturns & drive 3rd
World GDP.



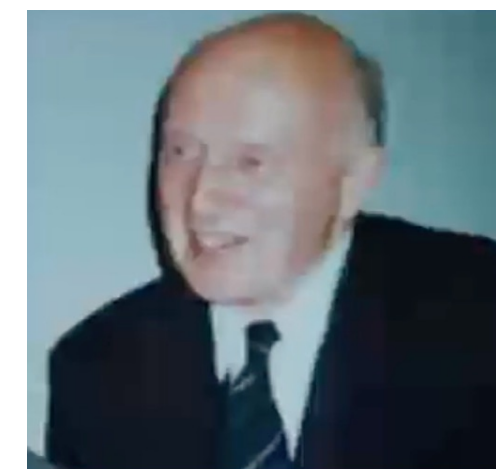
Original Benner Cycle Market Crash Periods Refined by Joseph Schumpeter
Idea = Innovation Alleviates Recession

Reality of Chemistry & Economics .. Industrial Innovation .. A Twist in the “Tale”

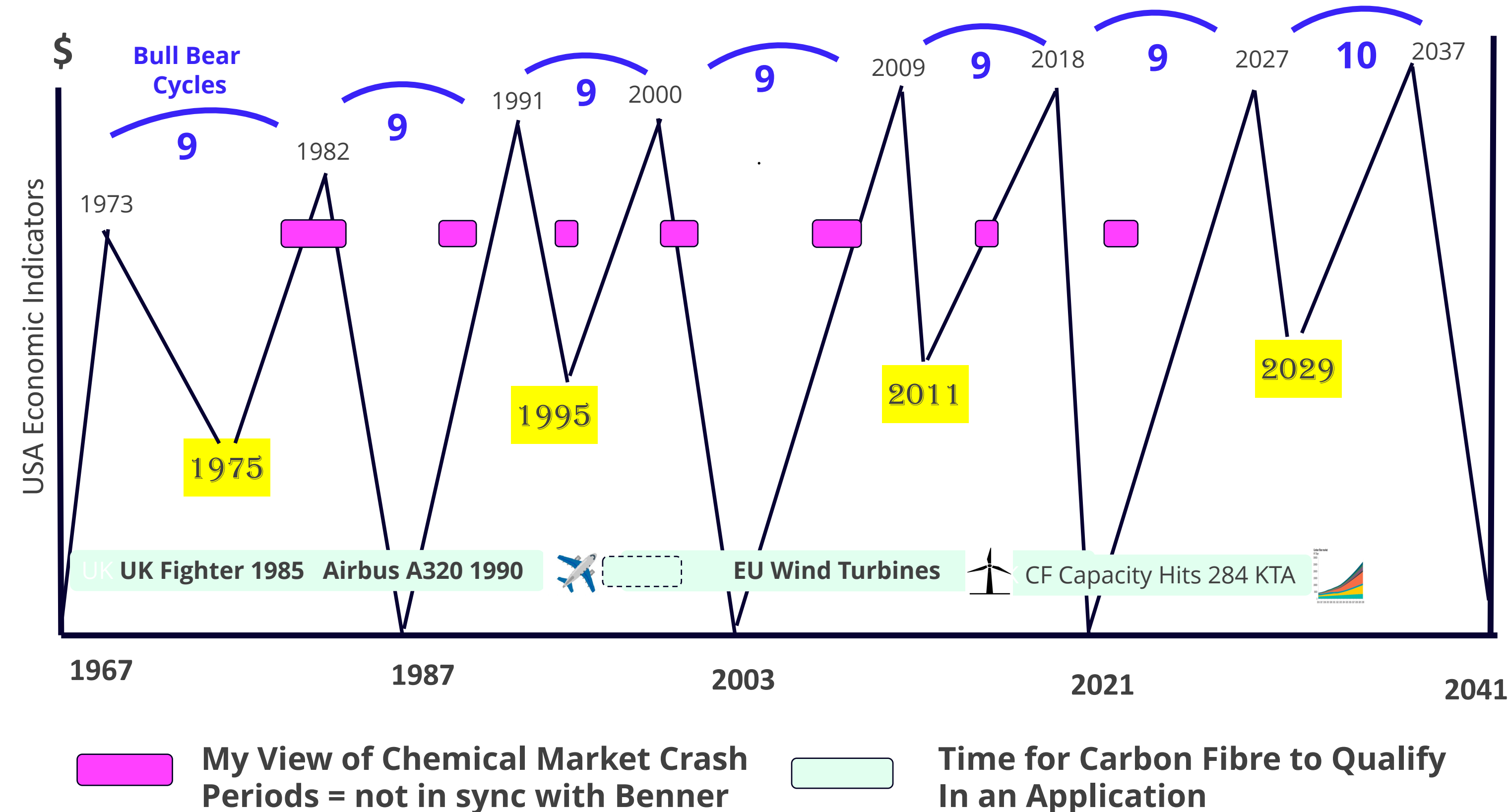
Key Points

20 Years = typical Feasibility IRR & ROI Scenario for a Chemical Plant – Most Plants Run 30 - 45 Years

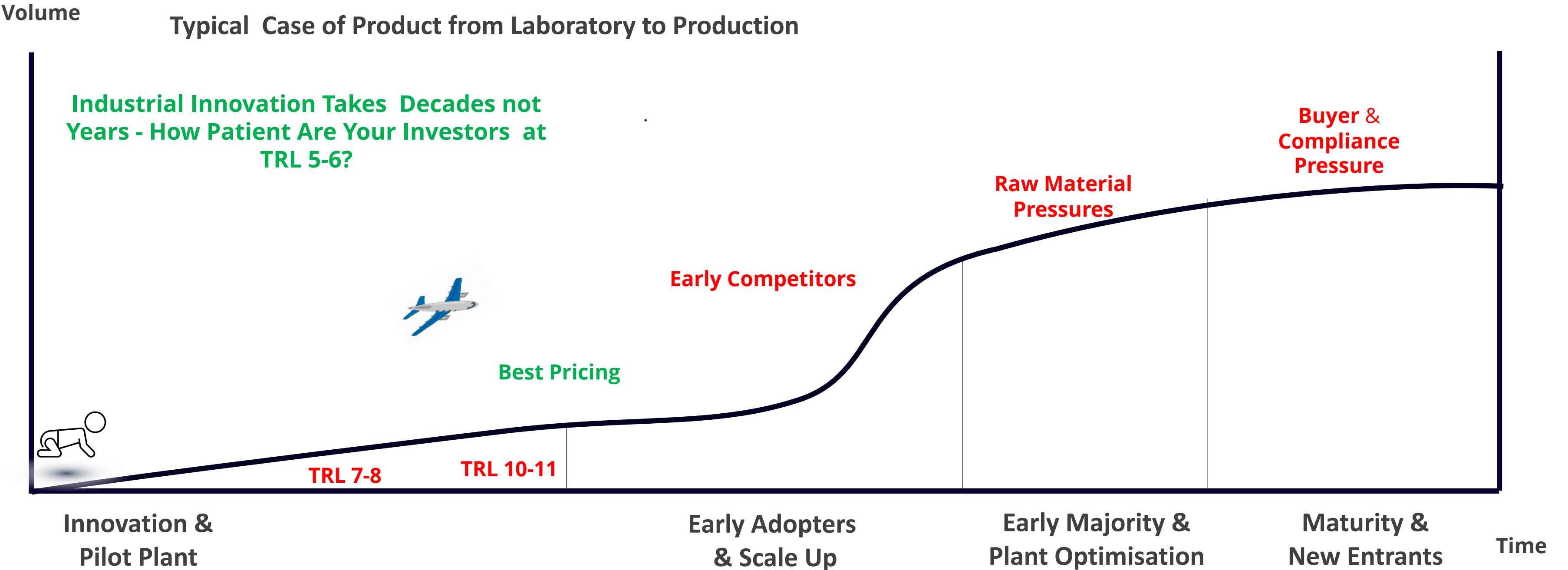
Even With Errors...Slumps Support Other Work on Business Cycles by J. Schumpeter & C. Freeman



In 1990s, Freeman & Perez found that Innovation Projects are “Started in Good Times” and not the in Downturns envisioned by Schumpeter

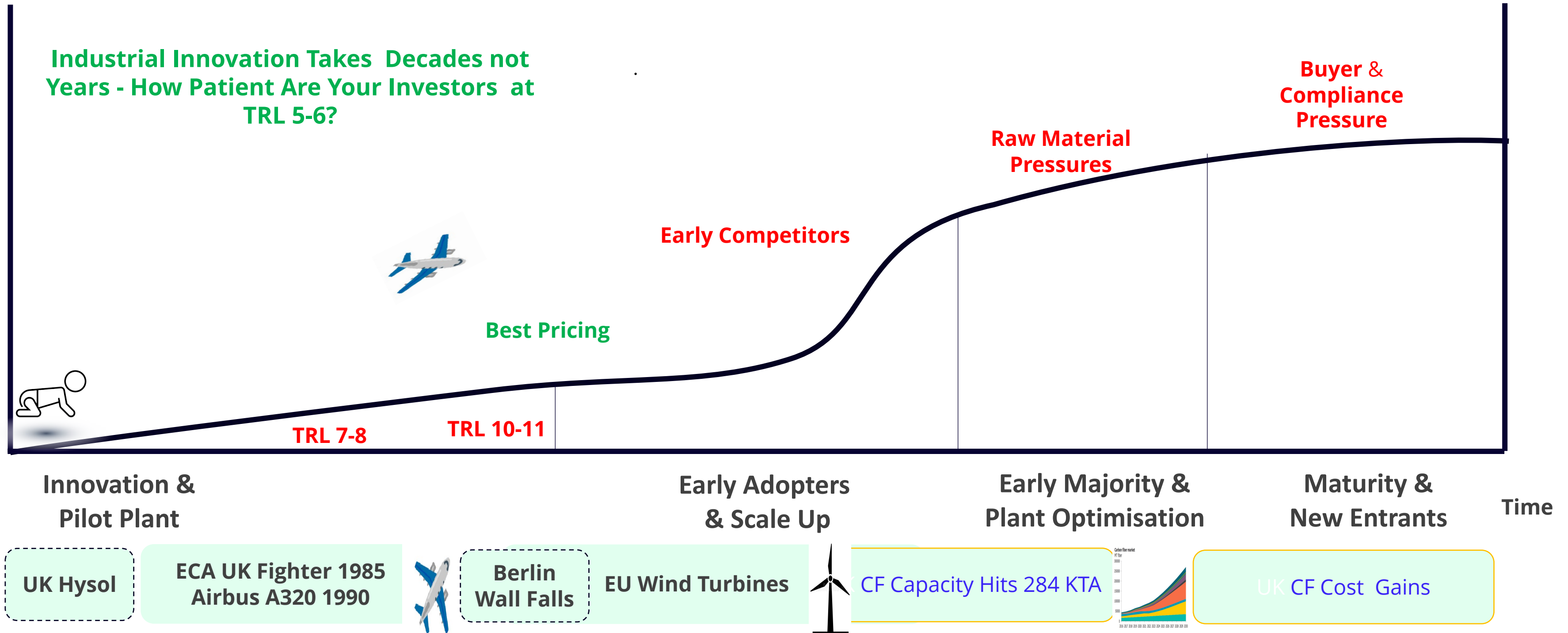


Classic ‘S’ Curve Industrial innovation ..



Classic 'S' Curve Industrial innovation ..

Volume Typical Case of Product from Laboratory to Production

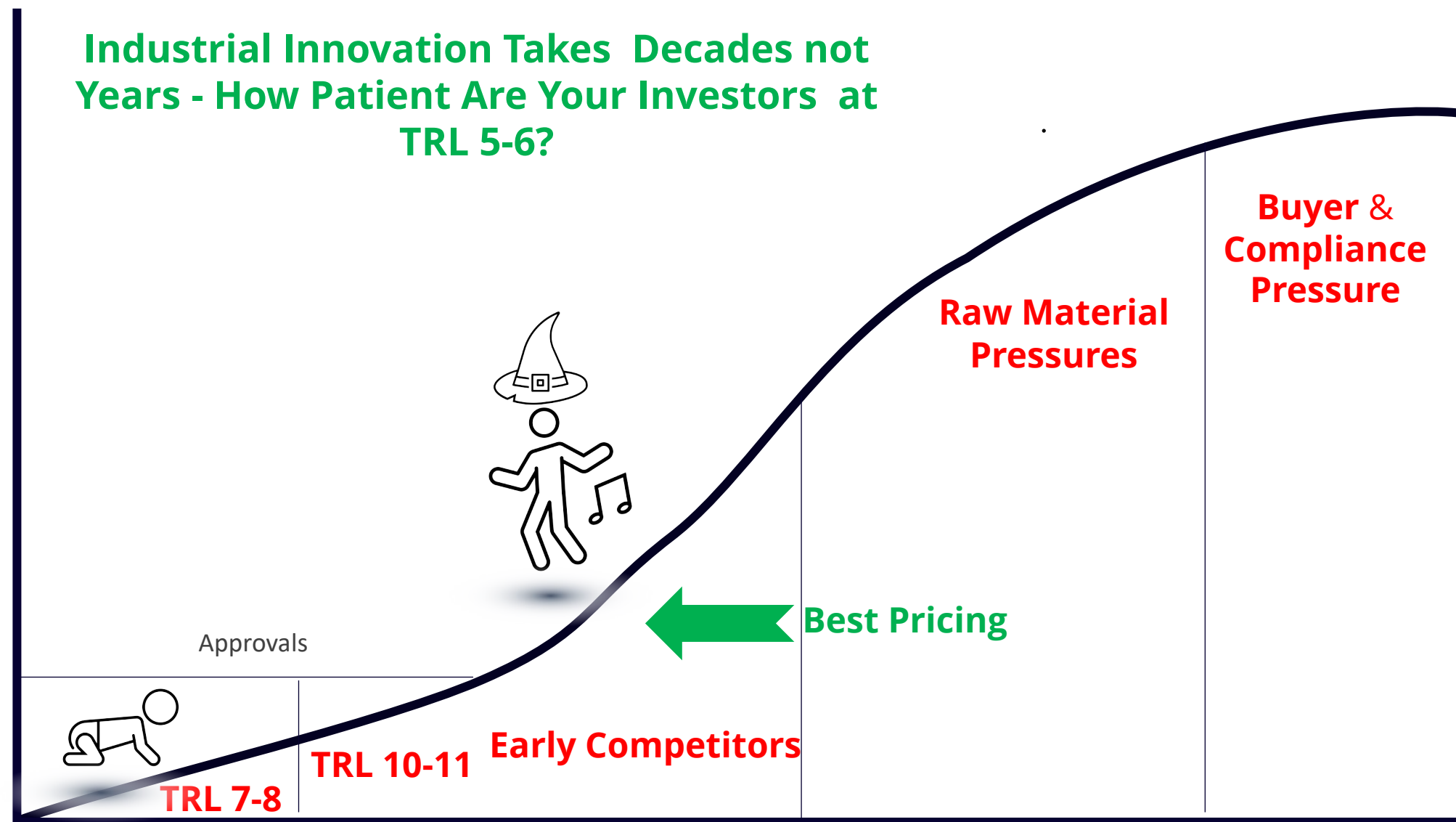


<https://op.europa.eu/en/publication-detail/-/publication/0d892e7c-9a9a-4ad1-ace6-9fdbf65918e3/language-it>

Classic 'S' Curve Industrial innovation ..

Typical Case of Product from Laboratory to Production

Volume



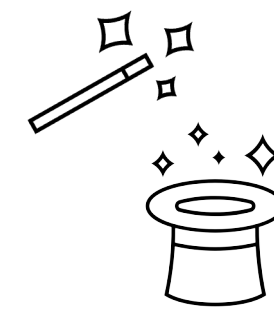
Innovation & Pilot Plant

Early Adopters & Scale Up

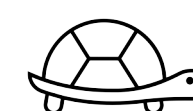
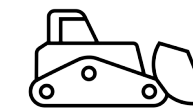
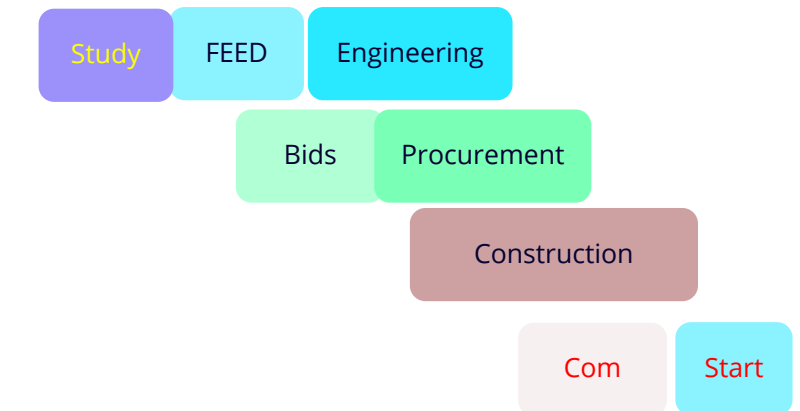
Early Majority & Plant Optimisation

Maturity & New Entrants

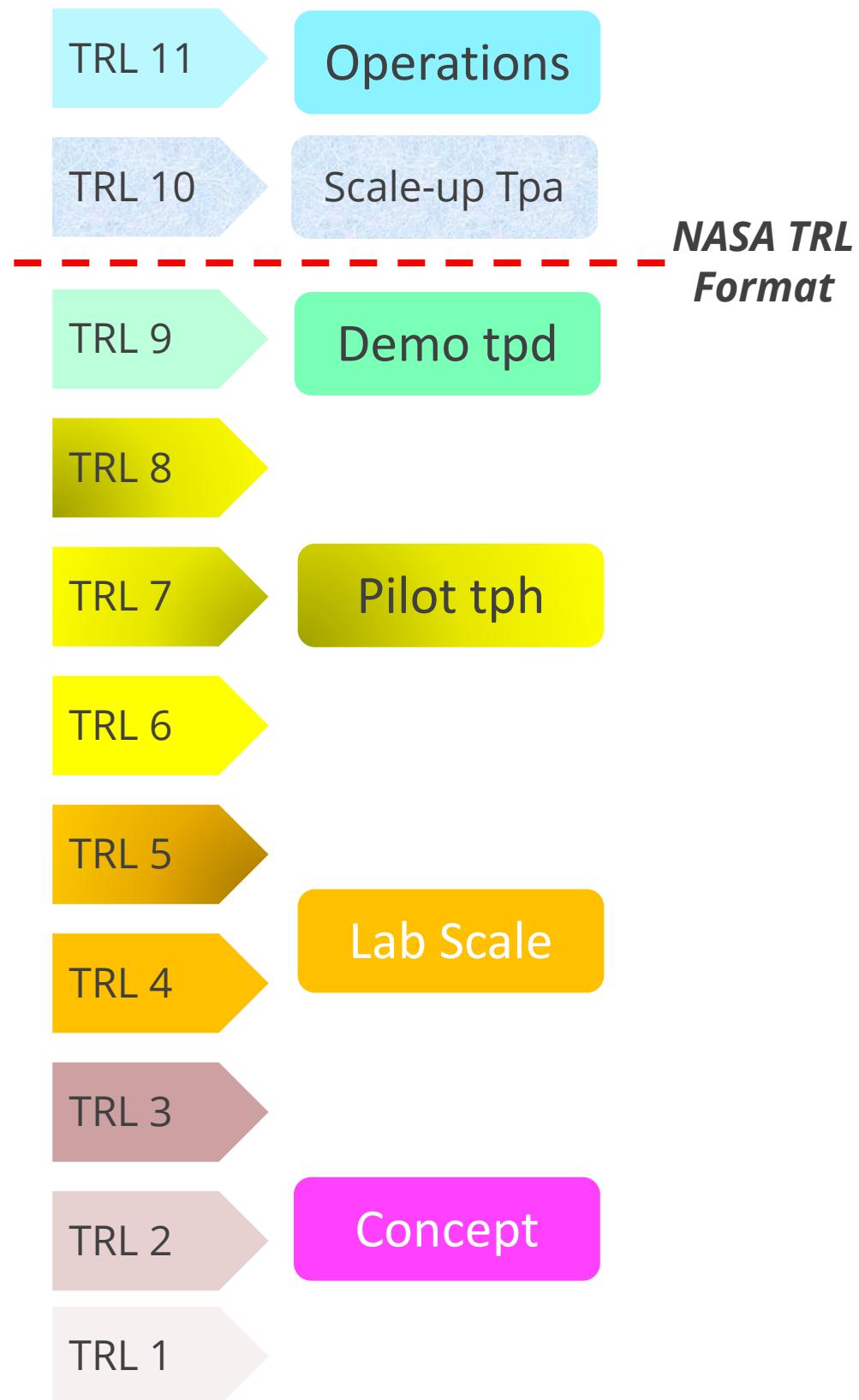
<https://op.europa.eu/en/publication-detail/-/publication/0d892e7c-9a9a-4ad1-ace6-9fdbf65918e3/language-it>



Post invention... & Lab Trials..
Engineering Firms want TRL 10 or 11.

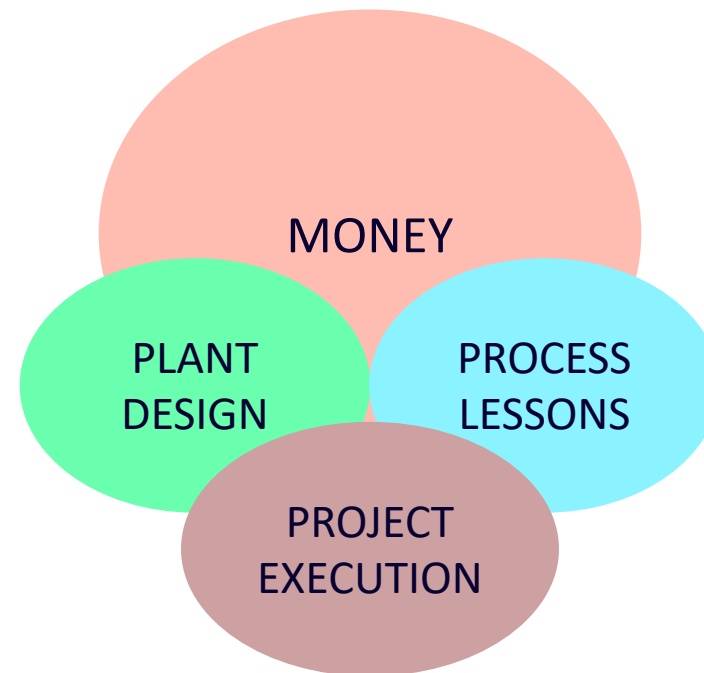


UK & EU Adopts NASA Technology Readiness Levels (TRL) and Scale-up



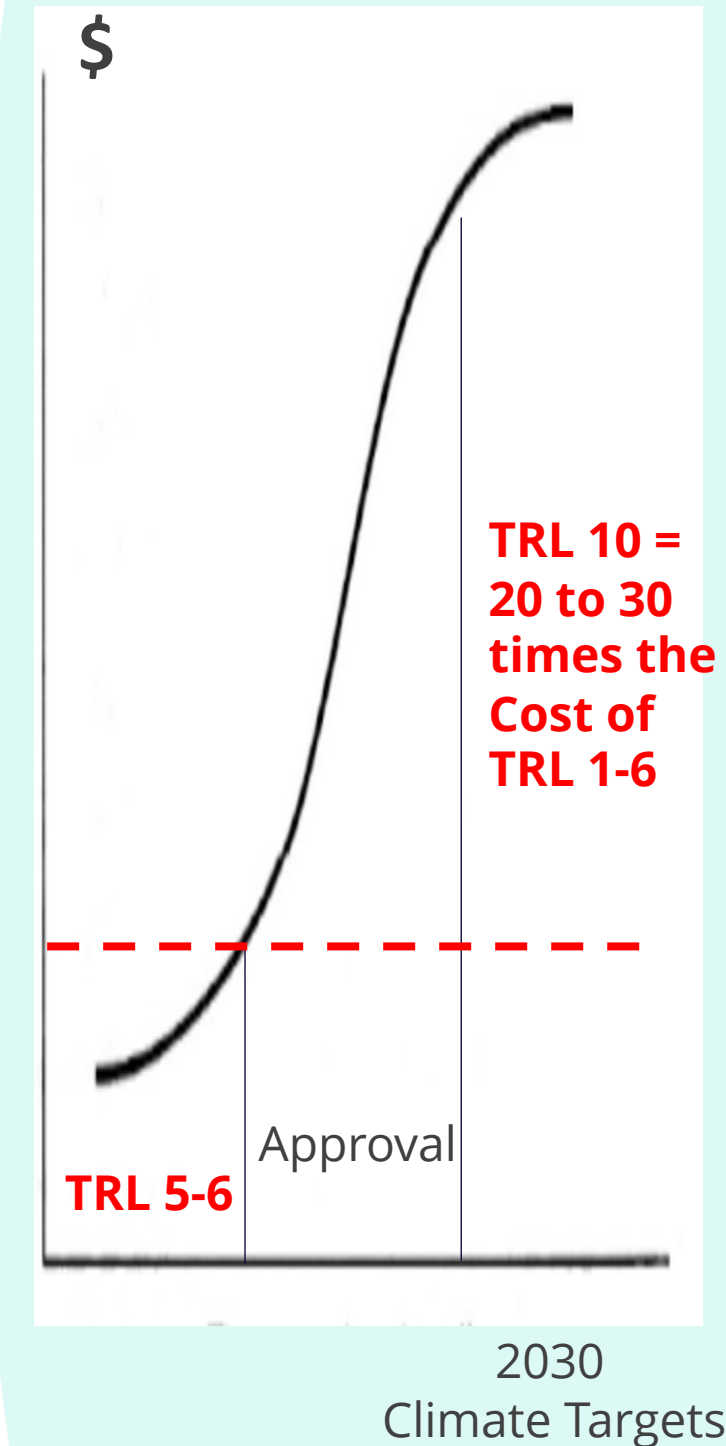
Revisiting Industrial Innovation

Experience is a bad teacher



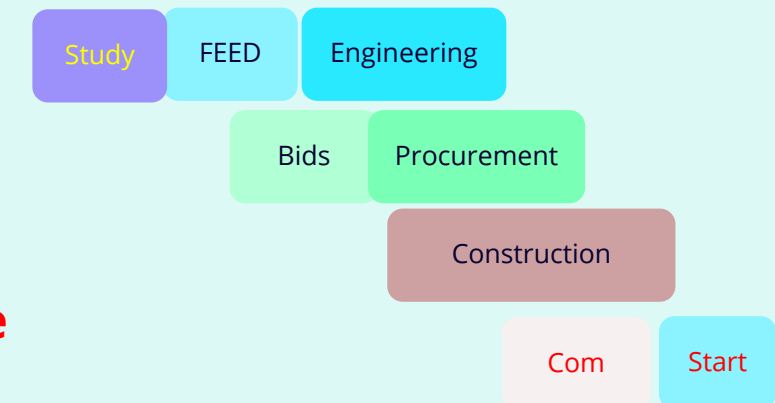
... First you get the Test and then the Lesson.
Oscar Wilde

E.g. Only 4% of Current H₂ Projects have FID



Risk vs. Time

EPC Project Schedule



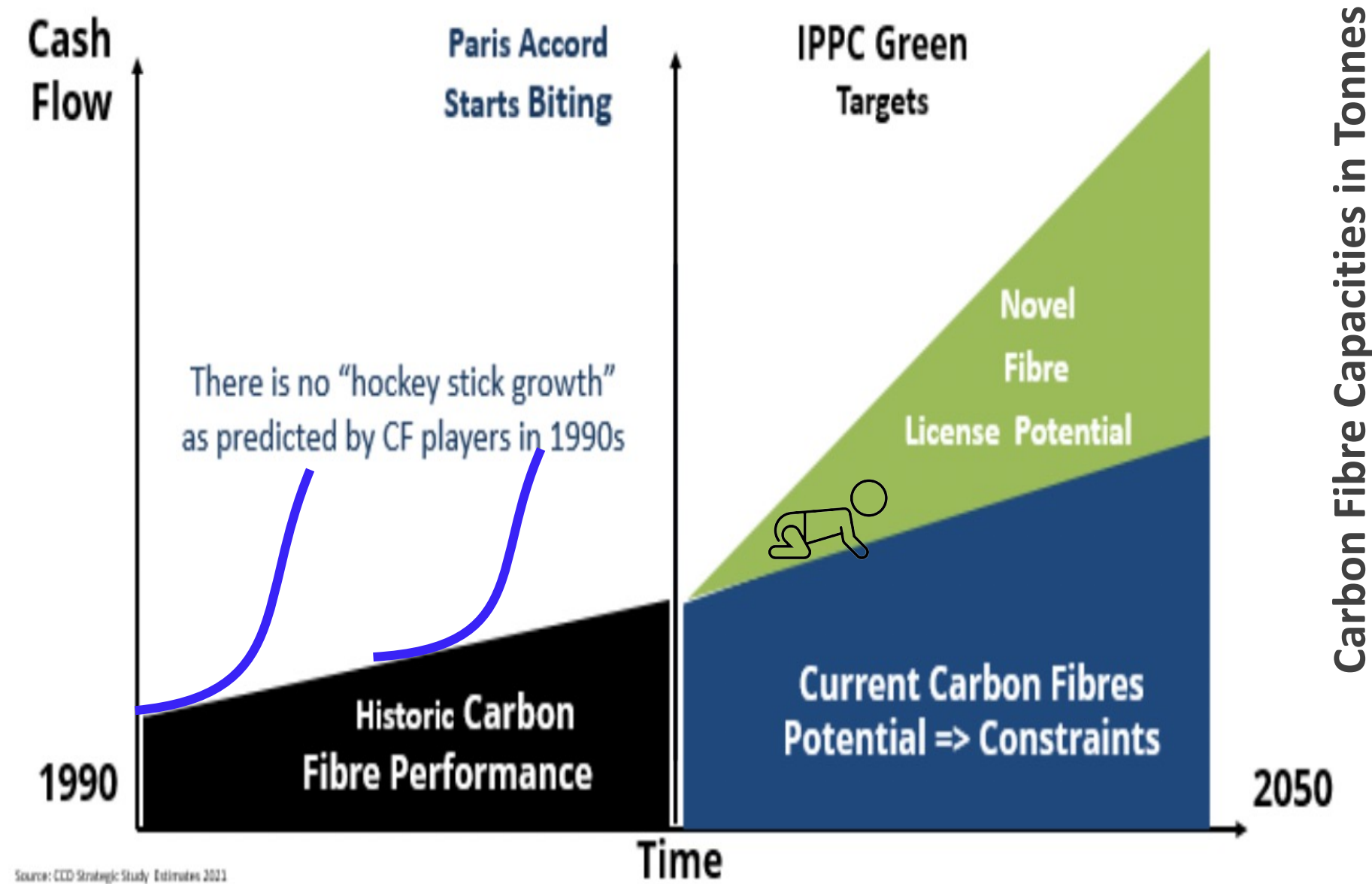
MONEY

Chemicals Basic Design Package
= 3 to 7% of Total Installed CAPEX

However, We See Limited M&A in Tech Start-ups to Date e.g. Carbon Fibres GO Along National Lines

Most CF Firms want to conquer the World on their own

Rival CF growth models lack robustness.

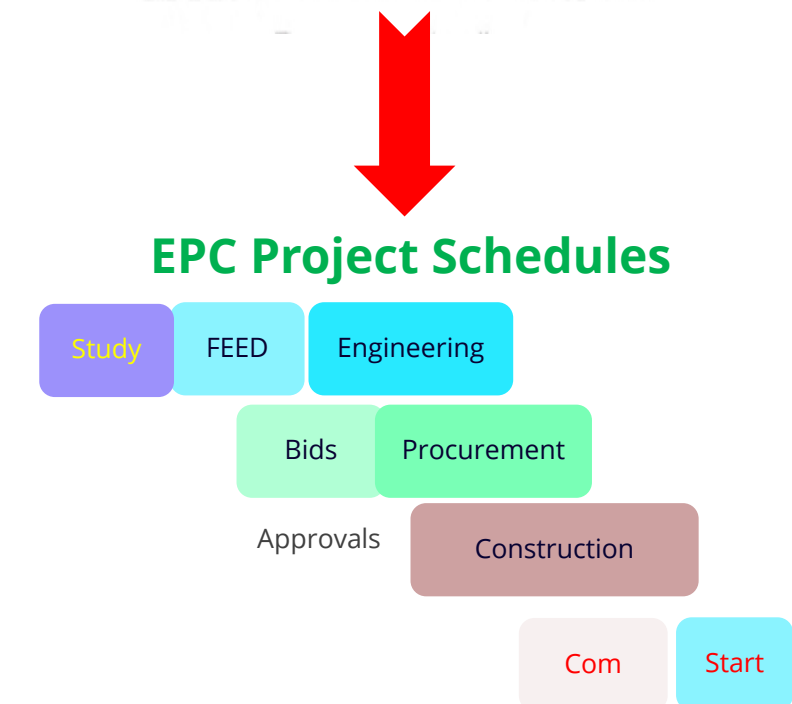
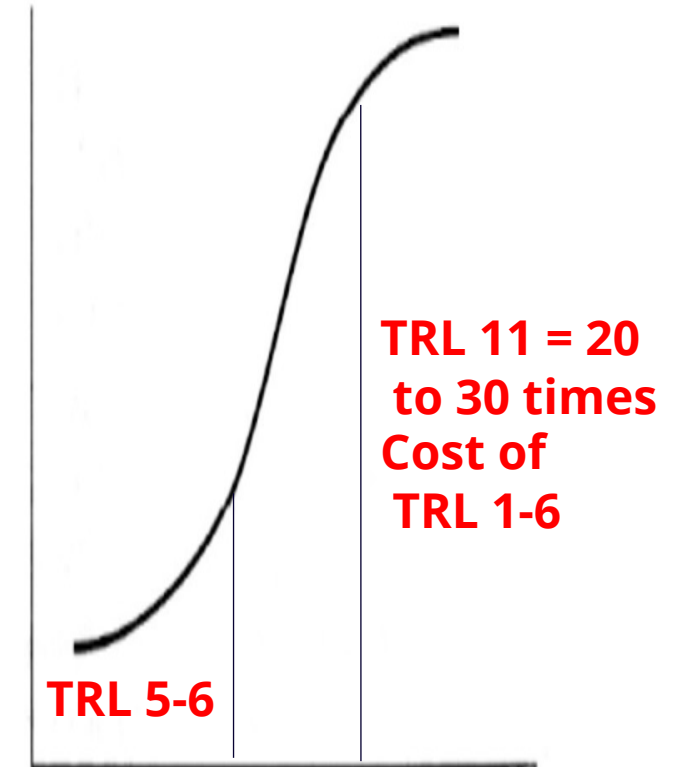
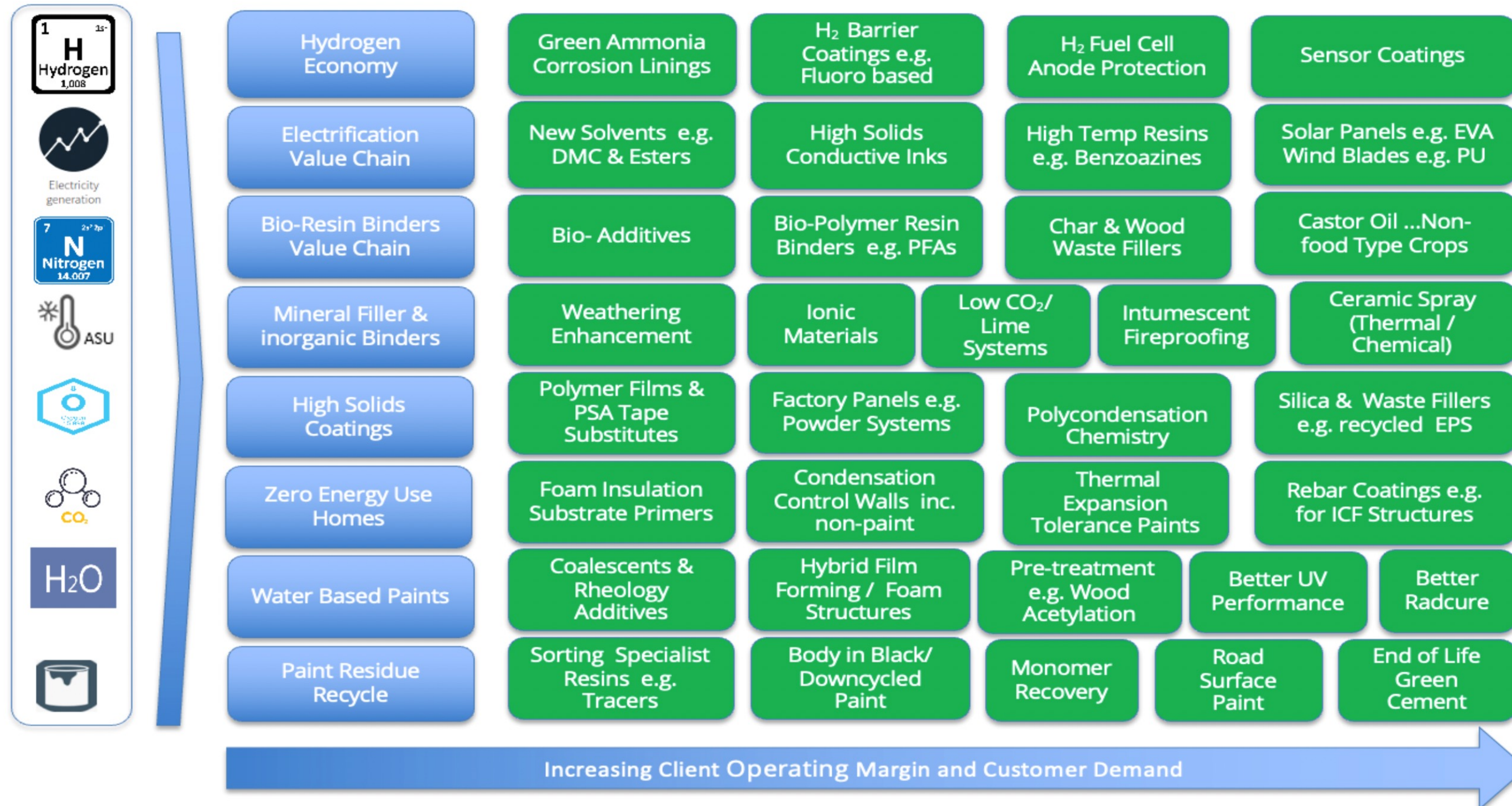


World Class Fibre Complements Resin Company Portfolios via its Licensing Business Plan

Manufacturer /	CCD Contact Y/N	HQ	2019	2020 Share	2028 Share
Toray	Y	Japan	57,000	36%	21.17%
Hexcel	N	U.S.	15,000	10%	5.65%
Mitsubishi Chemical	Y	U.S.	14,300	10%	5.65%
Teijin	Y	Japan	14,000	8%	7.41%
SGL Carbon	Y	Germany	13,000	8%	5.29%
Formosa Plastics	Y	Taiwan	8,800	5%	3.18%
Solvay Composites (Cytec)	Y	U.S.	4,400	4%	2.47%
Dow Akso	Y	U.S.	3,000	2%	3.53%
Hyosung	-	S. Korea	2,000	2%	2.29%
Zhongfu Shenying	Y	China	6,000	4%	7.69%
Hengshen	N	China	3,000	3%	1.76%
Jinggong S & T (Possible Machinery only)	No	China	1,000	1%	1.41%
Weihai Guangwei	N	China	2,000	1%	3.53%
Kangdixin	N	China	1,700	4%	24.70%
RIL India	Y	India	400	0%	0.88%
Umatex Rusatom	Y	Russia	1,400	1%	1.06%
Montedipe (Montefibre - Praedium)	Y	Spain	0	0%	0.04%
SABIC (+ planned Aramco Hyosung 3KTA)	Y	KSA	FEED	0%	1.06%
Various	Y	ROW	200	1%	1.24%
Total (Red numbers to be confirmed)			147,200	100%	100%

QUESTION: “Are we really qualified to do it well?”

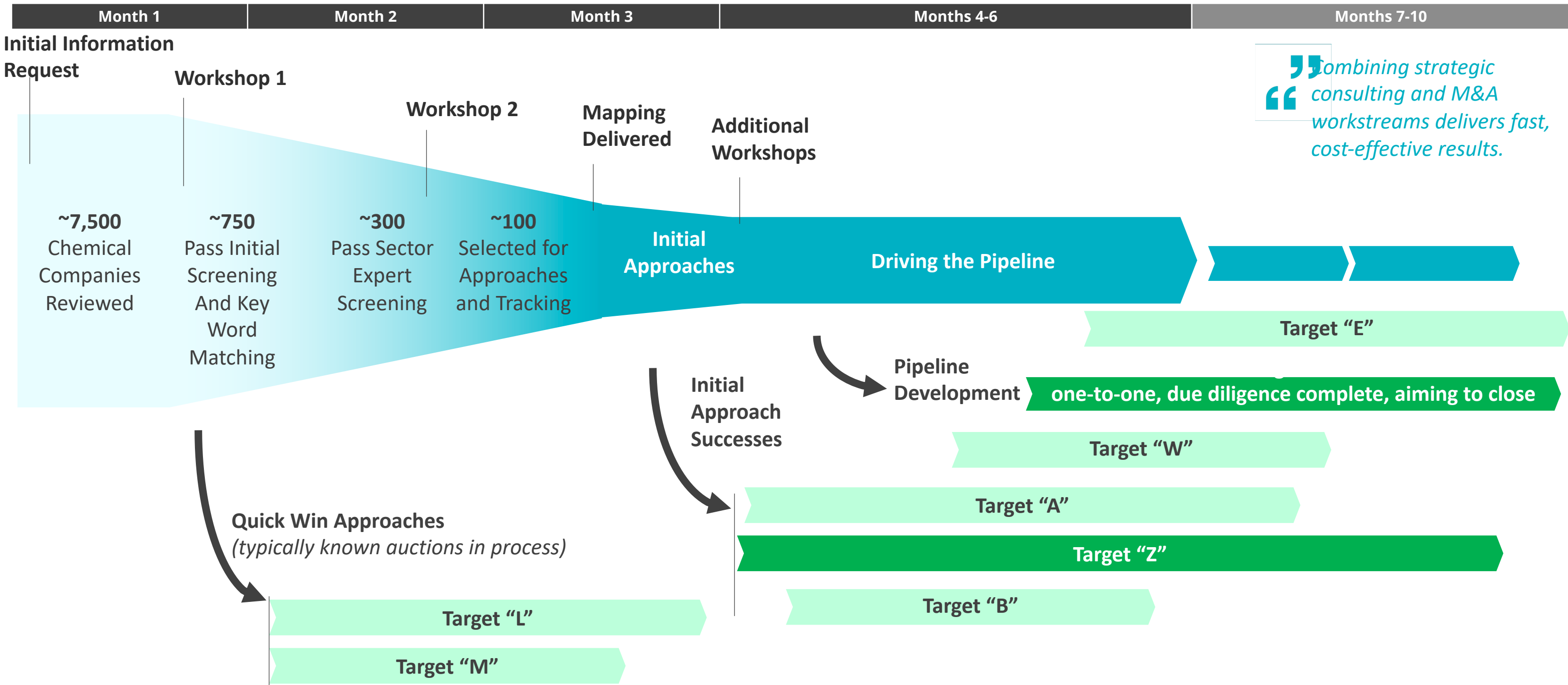
Industrial Innovation ... What are the winners ?



QUESTION: “Are we really qualified to do it well?”

Case Study Chems Project: Rigorous Mapping, Tracking and M&A Approaches

In this project CCD was engaged to identify, prioritise, and deliver a pipeline of potential acquisition and partnership opportunities.

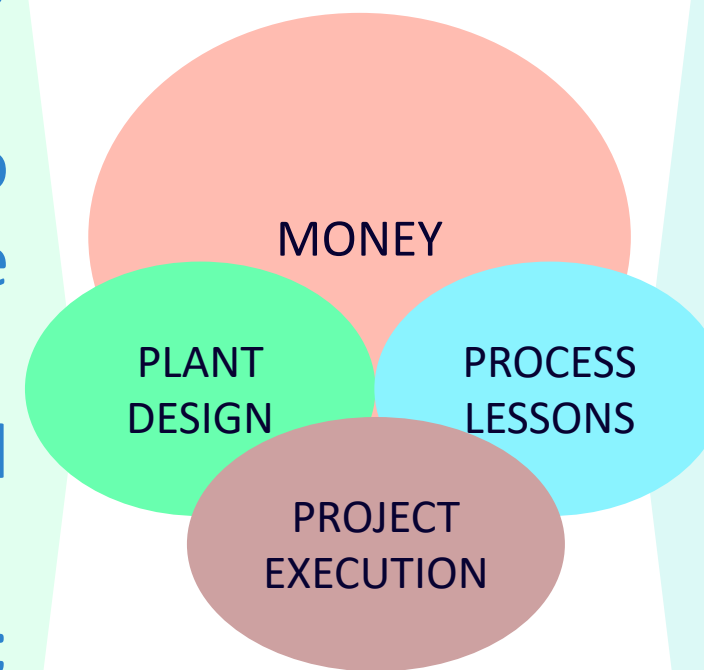


Rationale For M&A Innovation Option

Innovator or Developer Reasons

1. Control or share the innovation debt burden – ‘Cash Burn’ concerns.
2. **TIME** = Reduce **REAL** “Realistic Time to Market” i.e. reduce risks on markets, project client approvals, duplication.
3. Creative Individuals may prefer to devolve “Operations” & “Sales” to those with Commercial aptitude.
4. Acquire focus, licensing options and credibility with clients.
5. Faster earnings growth geographically; develop the corporate route for a long term future.
6. One less early competitor often in a regionally dominated service market.

A key aim = to get the pedal to the floor accelerate away



M&A innovating technology aims at maximises resources.

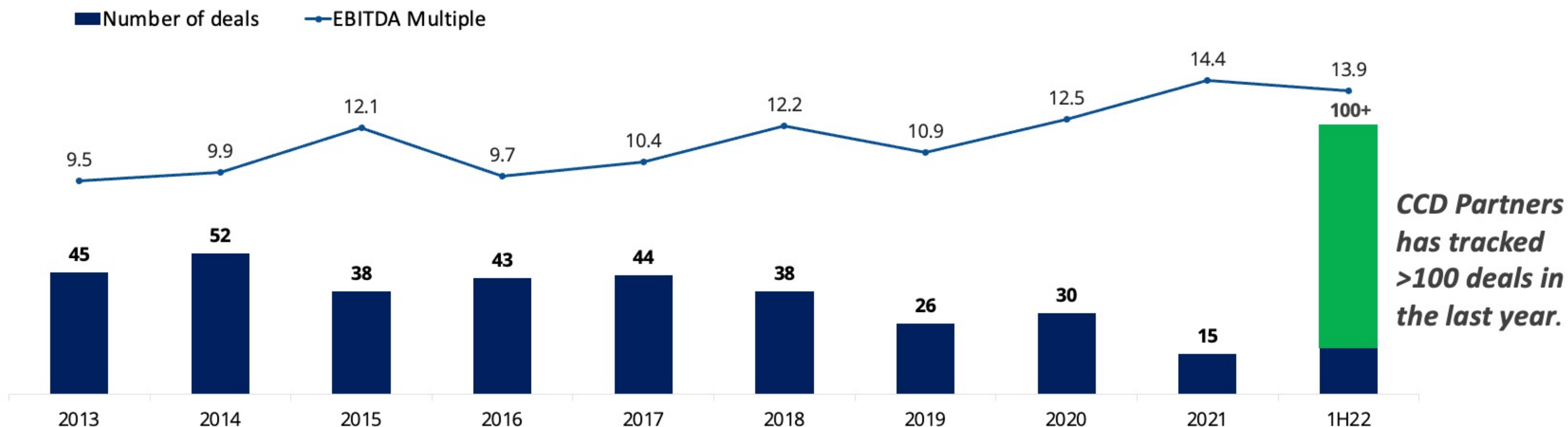
Reasons at JV Partner or M&A Buyers

1. **TIME** = Potential to complete corporate transformation over time by vaulting learning curves.
2. JV on Scale-Up cuts **overall** specific time-to-market & development risks in 1st mover case.
3. Revive sweep of R&D portfolio e.g. cut sacred cows and reduce outsider licensing risks via a commercial & operational partner not just an uncommitted technology supplier.
4. Beneficial production and avoiding application duplications by new geography, e.g. via:
 - 3rd party Global Licensing / Royalties policy.
 - Expanding sales range.
 - Using lessons learned.

Building out the Rationale / Scorecard

Transaction volume / timeline and multiples

Deal Activity in Specialty Chemicals



Source: Scott Macon Group Inc. Analysis of 2021 Valuation Multiples for Specialty Chemical Transactions.
Blue columns and line only include deals where valuation metrics were disclosed.

KEY TAKEAWAYS:

- Need method to filter opportunities and help build rationale for acquisition

Summary: There is a Rationale For M&A Biased Innovation Options in Terms of....



Resource maximization:



Time to market – Industrial Innovation rather than “1st Stage Discovery”



Intellectual Resources



Materiel Beneficiation



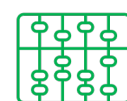
Risk of not reaching 2030 & 2050 Climate Goals via Collaborative R&D



Less waste



ROI or Stakeholder Returns



Synergies & Best Practice & Scale-up



Global Outlook and Faster Industrialisation



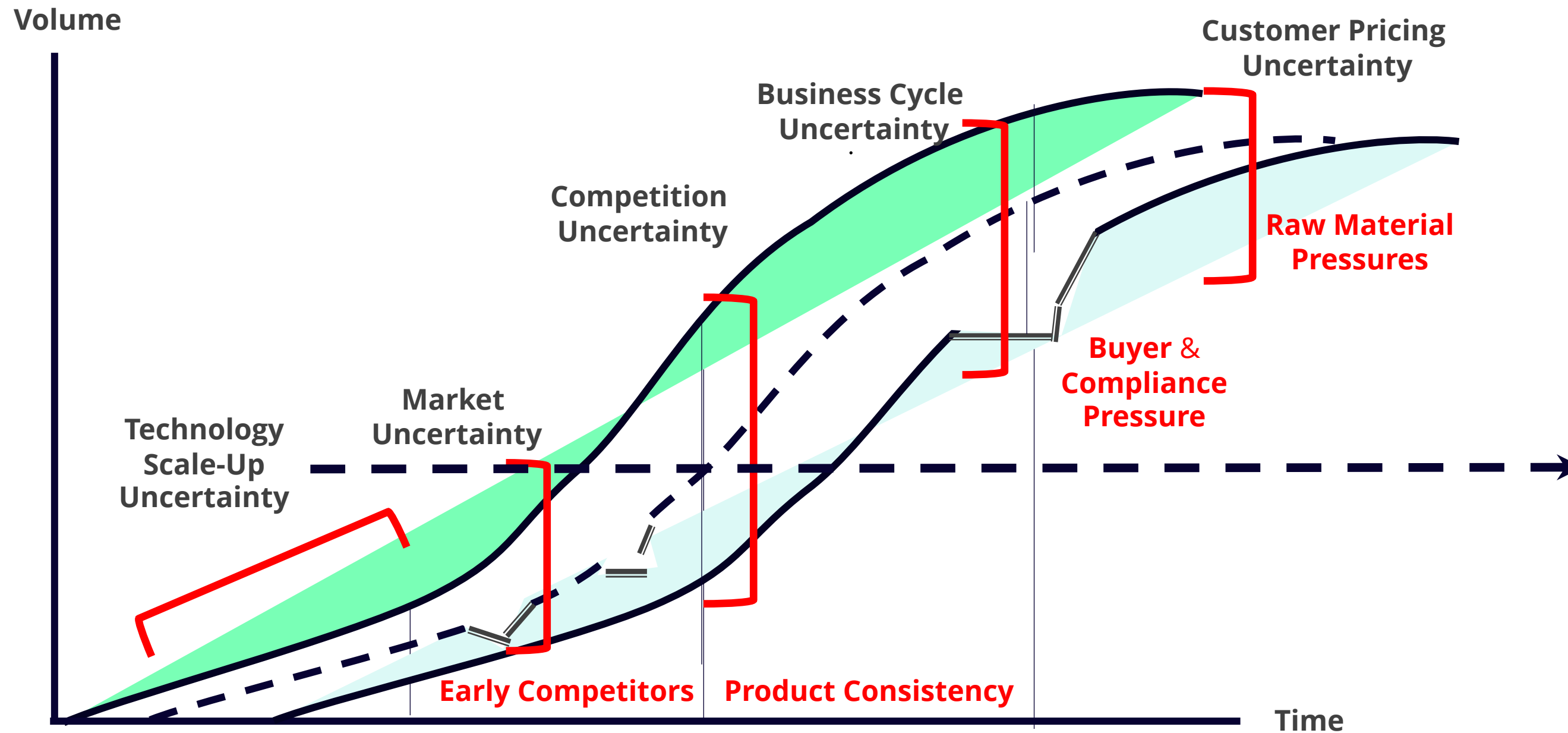
National Policy: Minimising Schumpeterian Economic Downcycling and Recovery Periods



At a risk of pooling sovereign “National Intellectual Property” and “National Programmes” via a stronger focus on shorter term or the less “Blue Sky” Scientific research aspects.



Industrial innovation - 'S' Curve More Realistic? Misses "National Systems of Innovation"



Early Priority = Pilot Plant ...

Scalable process at fair CAPEX.

Ops systems understanding to control final product quality necessary for customers.

Managed Combination of Engineering Disciplines

ECA UK Fighter 1985 Airbus A320 1990

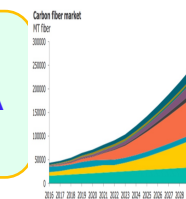


Berlin Wall Falls

EU Wind Turbines



CF Capacity Hits 284 KTA



PLANT DESIGN

PROCESS LESSONS

CLIENTS

Foreign Direct Investment - UK

Types of UK FDI Investment Projects (£ Million)	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	2021-22 % Change
New investment (FDI Focus is on Manufacturing)	1,179	1,035	1,153	888	907	2
Expansions	714	554	504	477	466	-2%
Mergers & Acquisitions incl JVs	179	193	195	173	216	25%
Total (Department for International Trade)	2,072	1,782	1,852	1,538	1,589	
M&A % of Total	9%	11%	11%	11%	14%	Source: DIT

Selected FDI Sectors 2021-22	No of Projects	New Jobs	Safeguarded Jobs	Total Jobs
Biotechnology & Pharmaceuticals	67	1,472	703	2,175
Chemicals & Agriculture	61	781	471	1,252
Life Sciences	94	3,999	151	4,150
Renewable Energy	60	1,464	421	1,885
Extractive Industries	NA	NA	NA	NA
Software & Computer Services (Biggest)	304	22,401	567	22,968

Source: <https://www.gov.uk/government/statistics/department-for-international-trade-inward-investment-results-2021-to-2022/department-for-international-trade-inward-investment-results-2021-to-2022-html-version>