Maps and the Environment

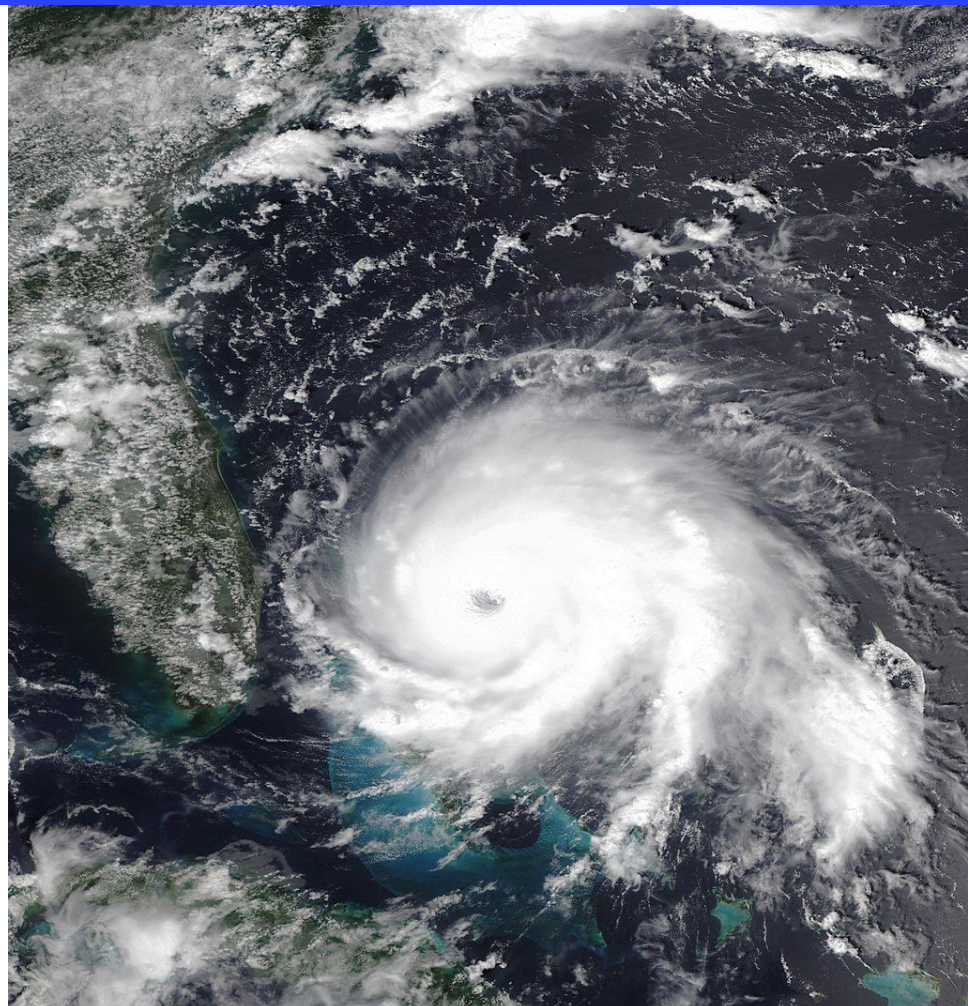
Mapping, Emissions and The Future

Anne Currie & Paul Johnston
Art by JDHancock.com

Hurricane Dorian

- 185mph winds
- =1st Strongest Atlantic Storm
- 70,000 left homeless (Bah.)
- 60+ dead, 400+ missing
- $8+ Billion damage

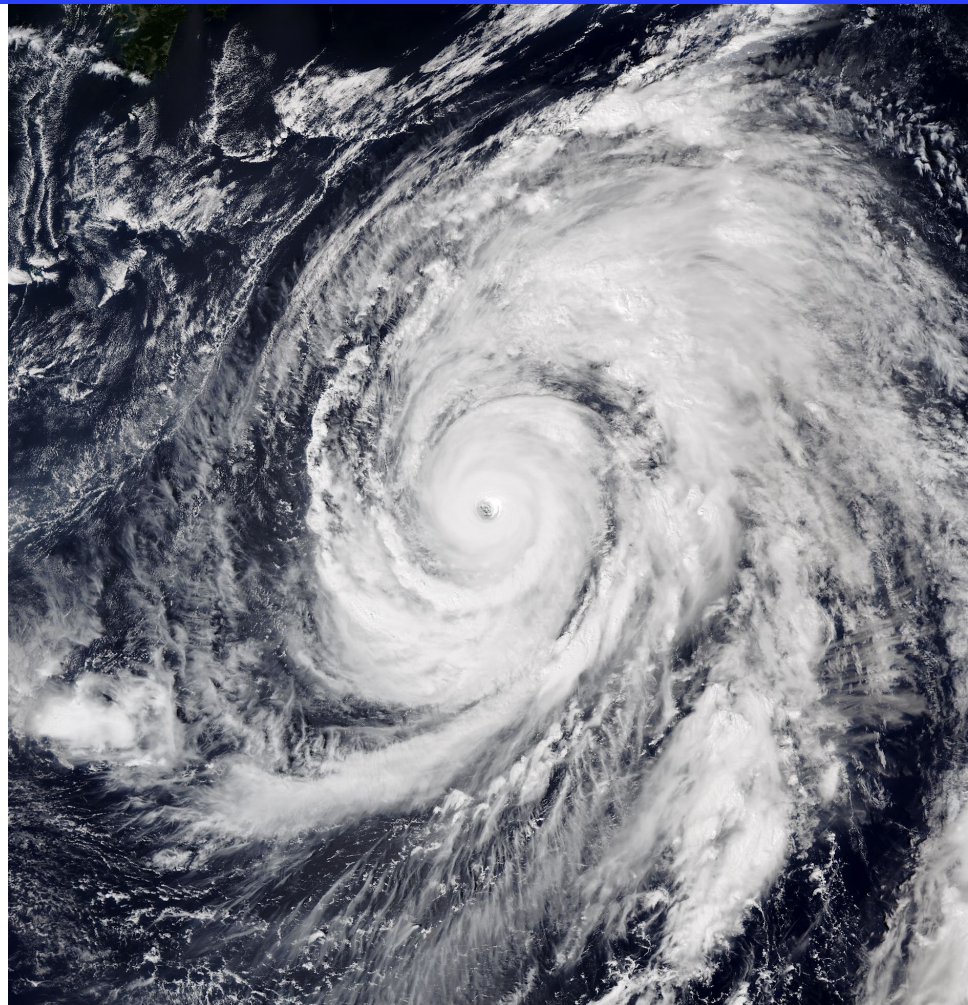
Photo and data: https://en.wikipedia.org/wiki/Hurricane_Dorian



Typhoon Hagibis

- 140mph winds
- Worst storm in *60 years*
- Almost 1000mm of rain in 24hrs
- 40 dead, 16 missing, 6m affected
- Typhoon “season” lasts longer

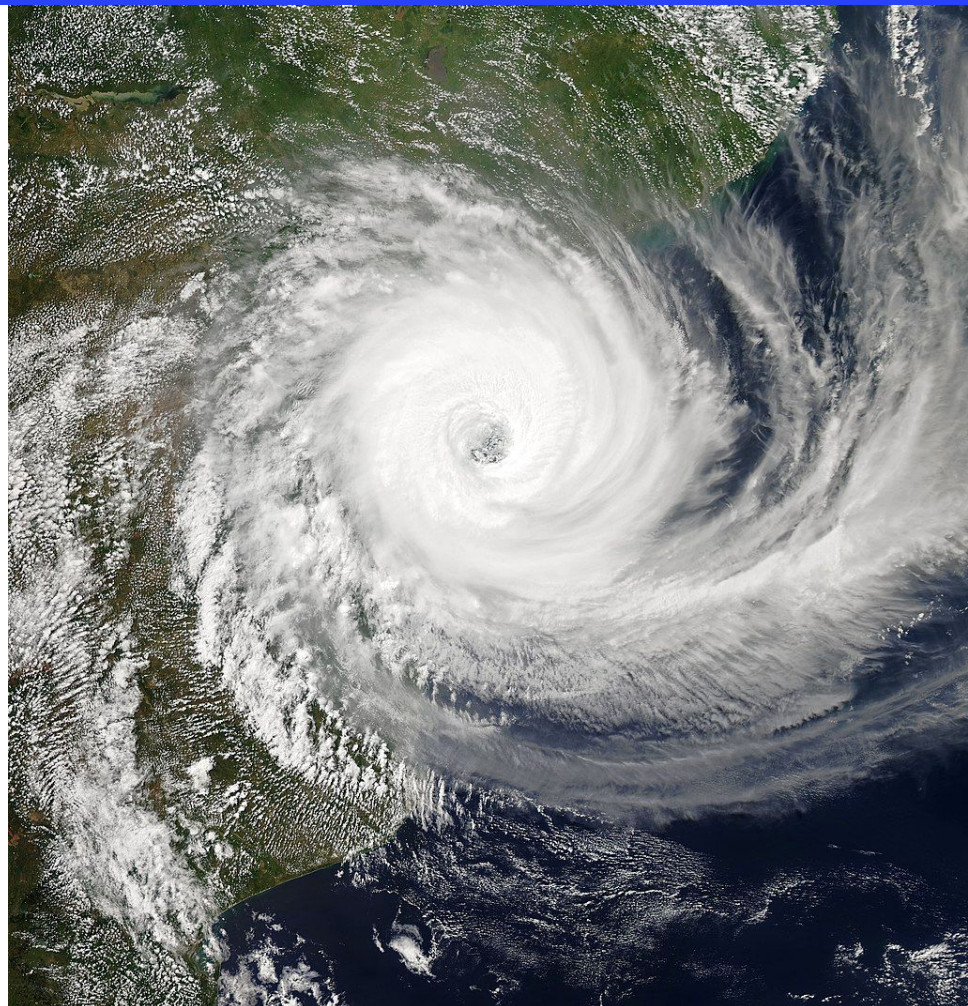
Photo: https://en.wikipedia.org/wiki/Typhoon_Hagibis_(2019)
Data: BBC News and Al Jazeera
https://twitter.com/Tom___Scott/status/1183408521389445120
https://www.bbc.co.uk/news/world-asia-50037907



Cyclone Idai

- Madagascar, Mozambique, Malawi, Zimbabwe
- 125mph winds
- 2nd Deadliest in Indian Ocean
- 1300+ dead, 2000+ missing, 3m affected
- $2 Billion in damage

Photo and data: https://en.wikipedia.org/wiki/Cyclone_Idai



All of these “extreme weather events” happened in 2019

Climate Change leads to ocean warming which leads to:

- Stronger storms
- Slower storms
- Larger storms
- More rainfall
- Moving more slowly

Note: it doesn't lead to *more* storms

From:
https://skepticalscience.com/Where-is-global-warming-going.html

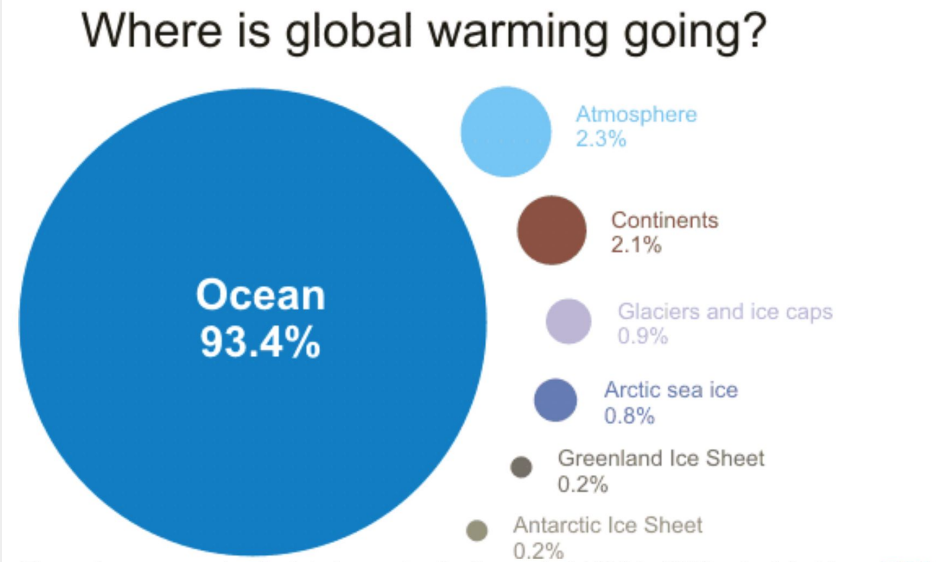


Figure 1: components of global warming for the period 1993 to 2003 calculated from IPCC AR4 5.2.2.3.

“Extreme Weather” is becoming the **new normal**

4C World "Uninsurable" - AXA

https://www.greenbiz.com/article/axa-4c-warming-makes-world-uninsurable

AXA: 4C warming makes the world uninsurable

Michael Holder
Monday, December 18, 2017 - 1:40am

Insurance giant AXA has announced a quadrupling of its 2020 green investment target from $3.53 billion to $14.13 billion as the company's CEO warned more than 4 degrees Celsius of warming this century would make the world "uninsurable."

Launched at the One Planet Summit in Paris, Axa unveiled this week a raft of climate policy moves that also will see it further reduce its exposure to fossil fuel assets.

Change is coming

(although what that change will be…?)

Paul Johnston
Climate Activist
Interim CTO
Advisor
Community Energy Director
ex-AWS

Anne Currie
Strategist
Author of Panopticon Series
Technologist
Ethics

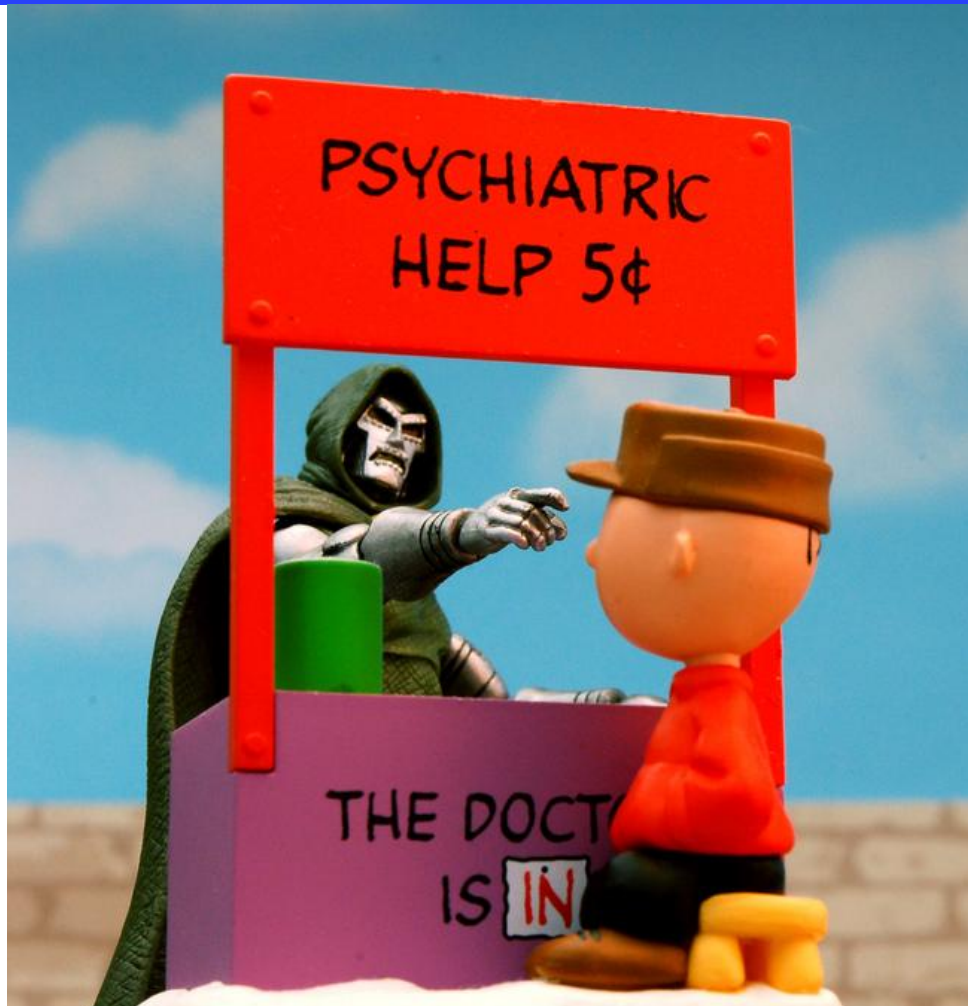
Employees of big companies joined the #ClimateStrike

Photo: https://twitter.com/AMZNforClimate/status/1176496508771950593

A typical AWS employee banner at the #ClimateStrike

Photo: https://twitter.com/AMZNforClimate/status/1176496508771950593

Data centres produce about as much greenhouse gas as aviation



Aviation is bad!

✈️

LHR → JFK → LHR

More than 3 tonnes CO2 per person

Photo: twitter.com/profraywills/status/1046231254075465728

Cloud is more efficient!

Jevons Paradox

Efficient Clouds means more usage

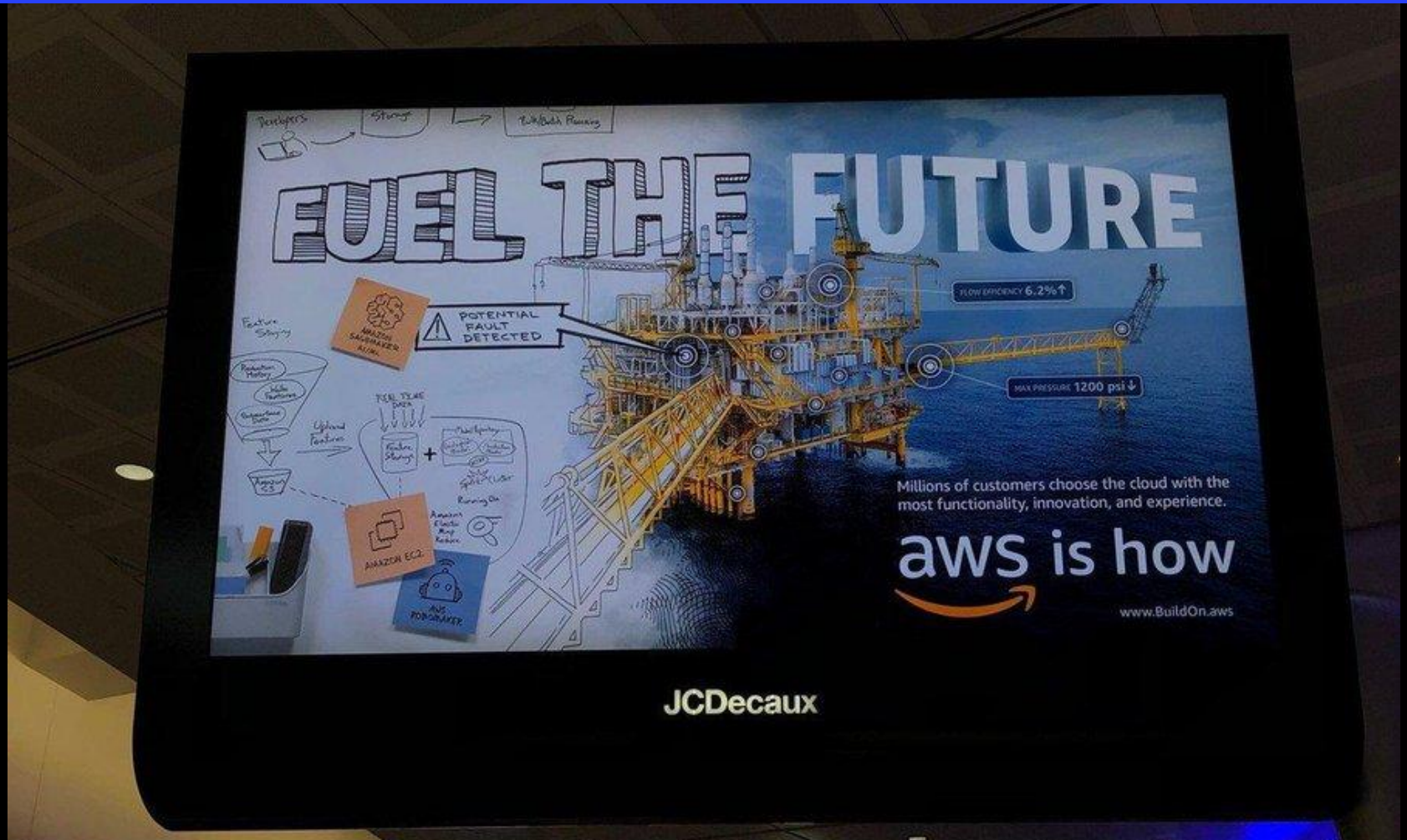
So Cloud must be powered in a Sustainable way

Good News: Google and Azure are pretty sustainable (100% offset)

Bad News: AWS are not (50%)

Data centre ethics whitepaper (2018)
https://bit.ly/2024wp

https://sustainability.aboutamazon.com/


FUEL THE FUTURE
POTENTIAL FAULT DETECTED
FLOW EFFICIENCY 6.2%↑
MAX PRESSURE 1200 psi↓
Millions of customers choose the cloud with the most functionality, innovation, and experience.
aws is how
www.BuildOn.aws
JCDecaux

Greenwash!

Amazon are in the Top 200

emitters of GHG worldwide

So…
What has this got to do with mapping?

We have a global “Carbon Budget” and we have to

REDUCE EMISSIONS BY A LOT

And almost certainly take Carbon out of the atmosphere too

More “extreme weather” events…

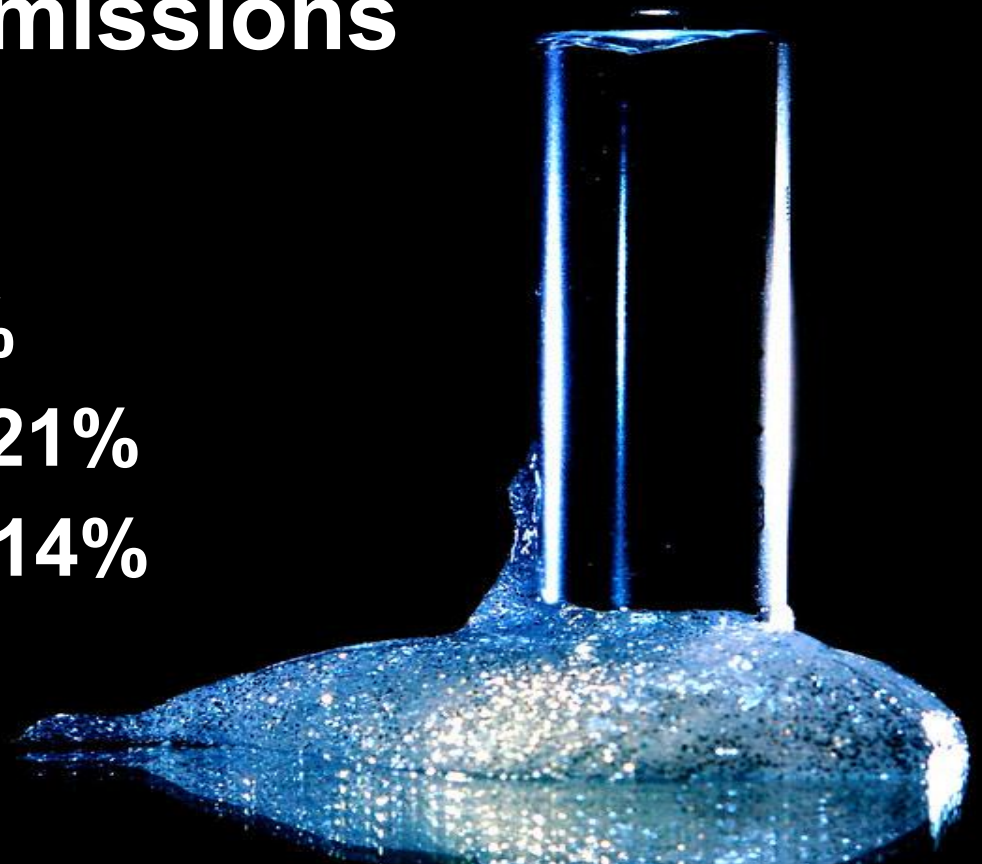
Big companies being “green”…

“Cloud” and Carbon Budgets...

This is all going to
“change the landscape”

Sources of emissions

Electricity 25%
Agriculture 24%
Manufacturing 21%
Transportation 14%
Buildings 6%



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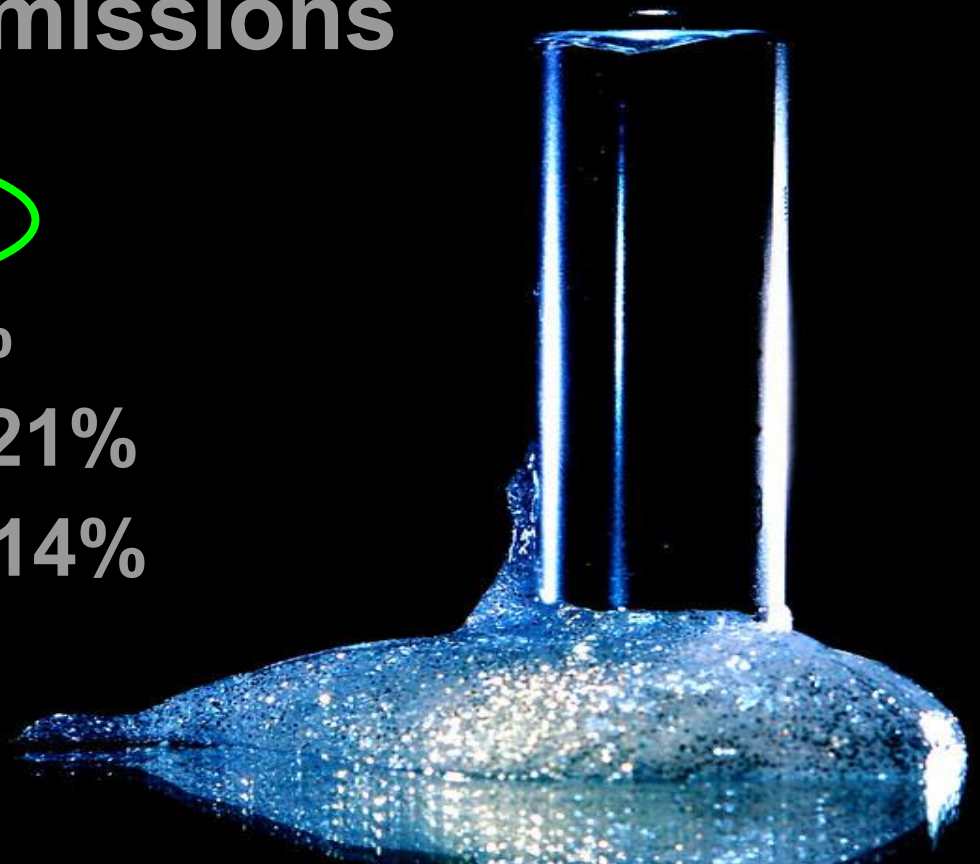
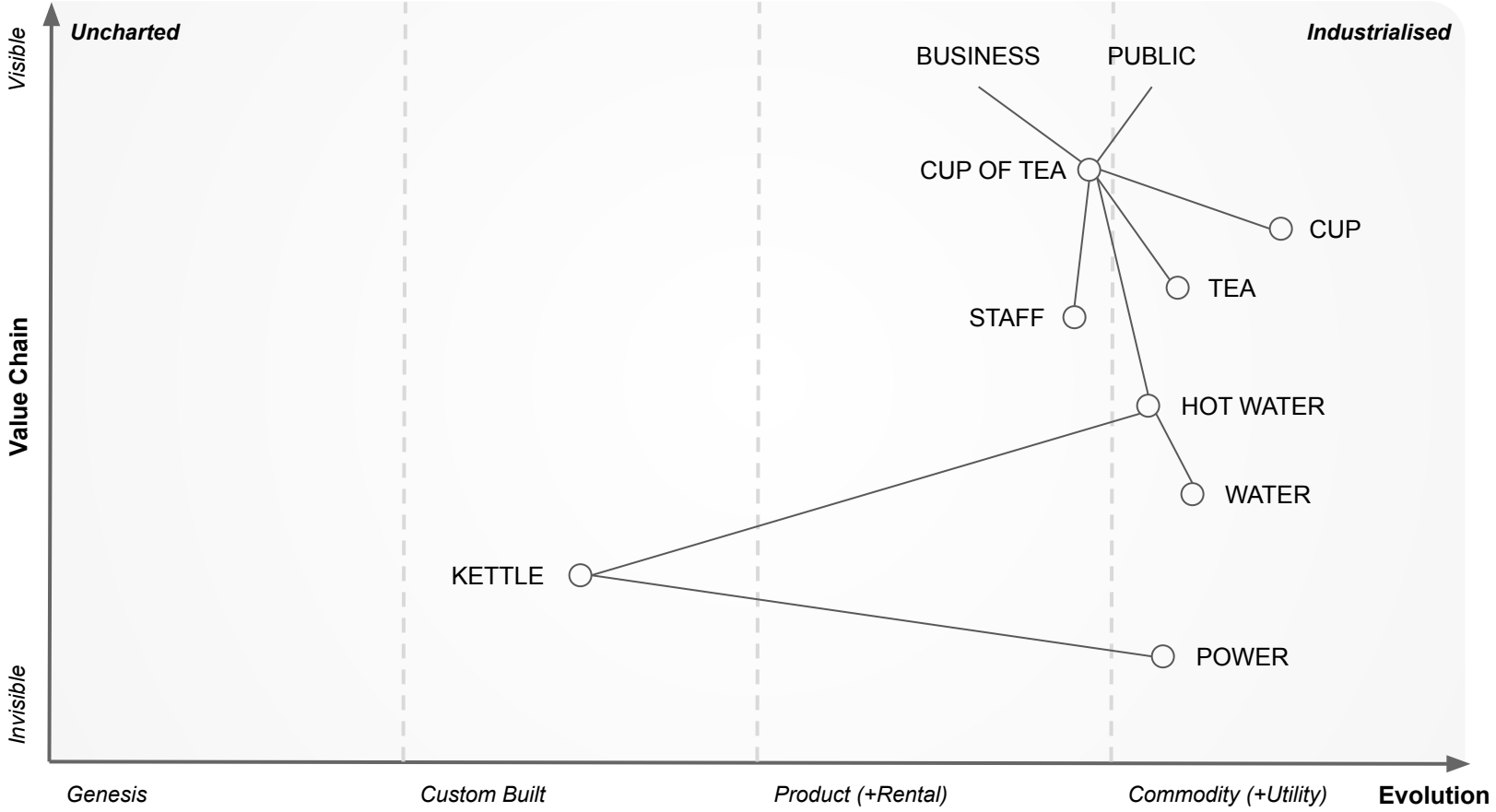


Let’s have a nice “Cup of Tea”

and think about this...


Uncharted
Industrialised
Visible
Value Chain
Invisible
BUSINESS
PUBLIC
CUP OF TEA
CUP
TEA
STAFF
HOT WATER
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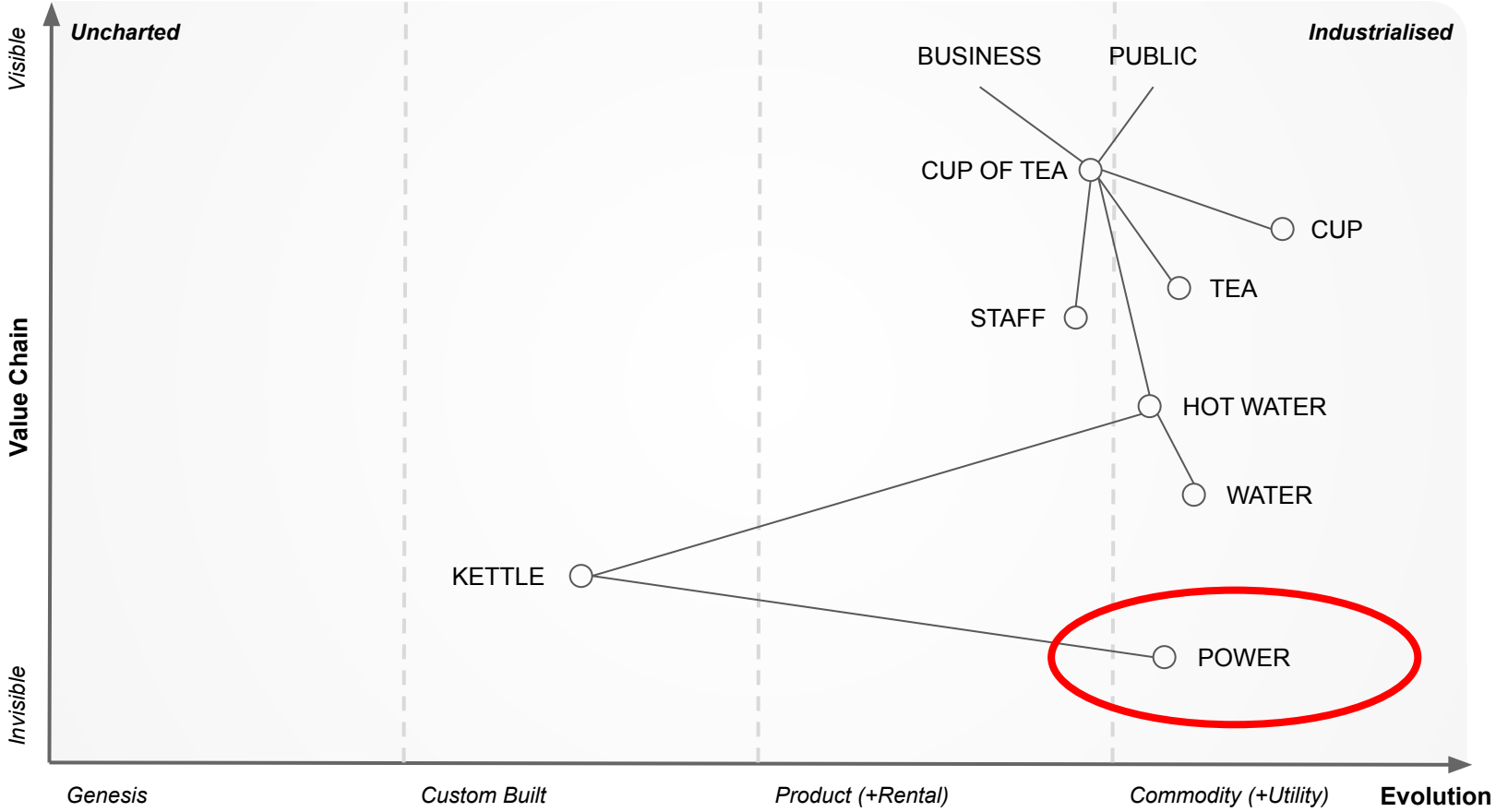
KETTLE
POWER
Genesis
Custom Built
Product (+Rental)
Commodity (+Utility)
Evolution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Custom Built
Product (+Rental)
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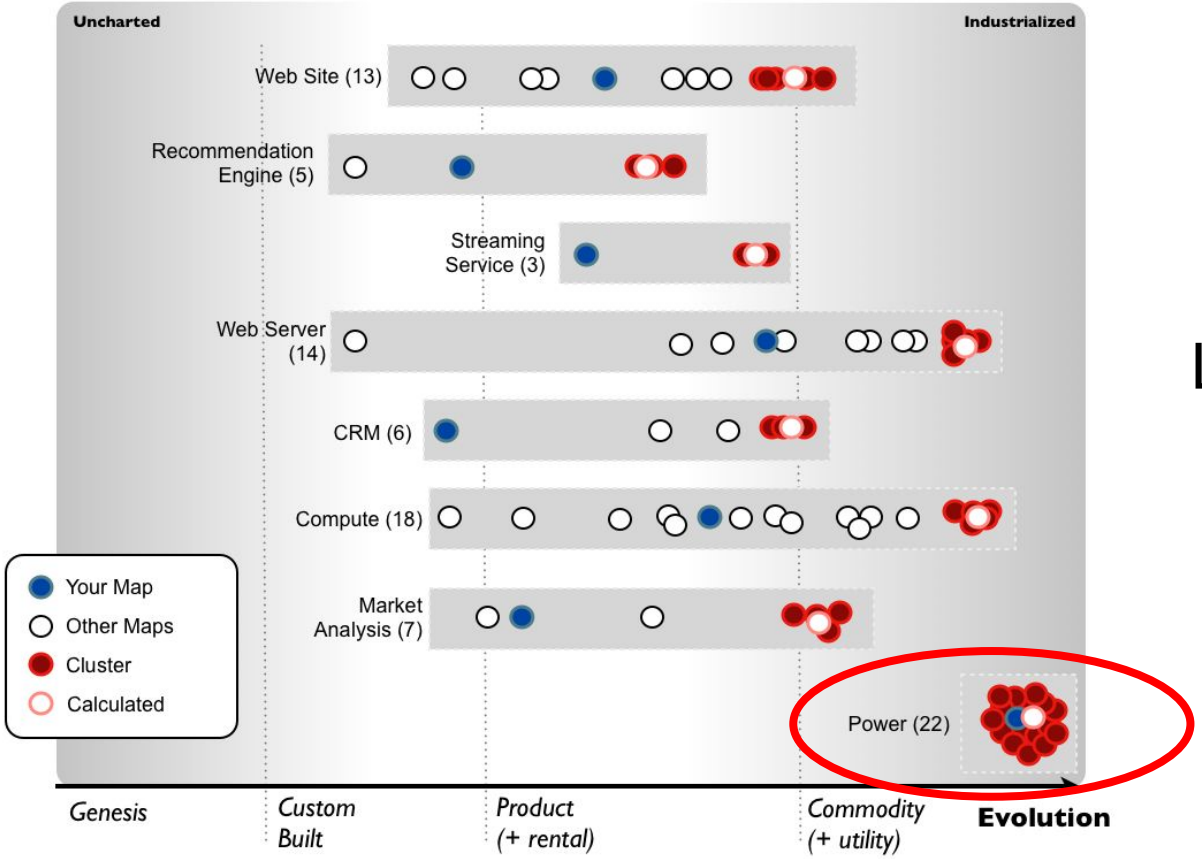
Evolution

Note: Emissions are highly abstracted in a mature oil-based economy

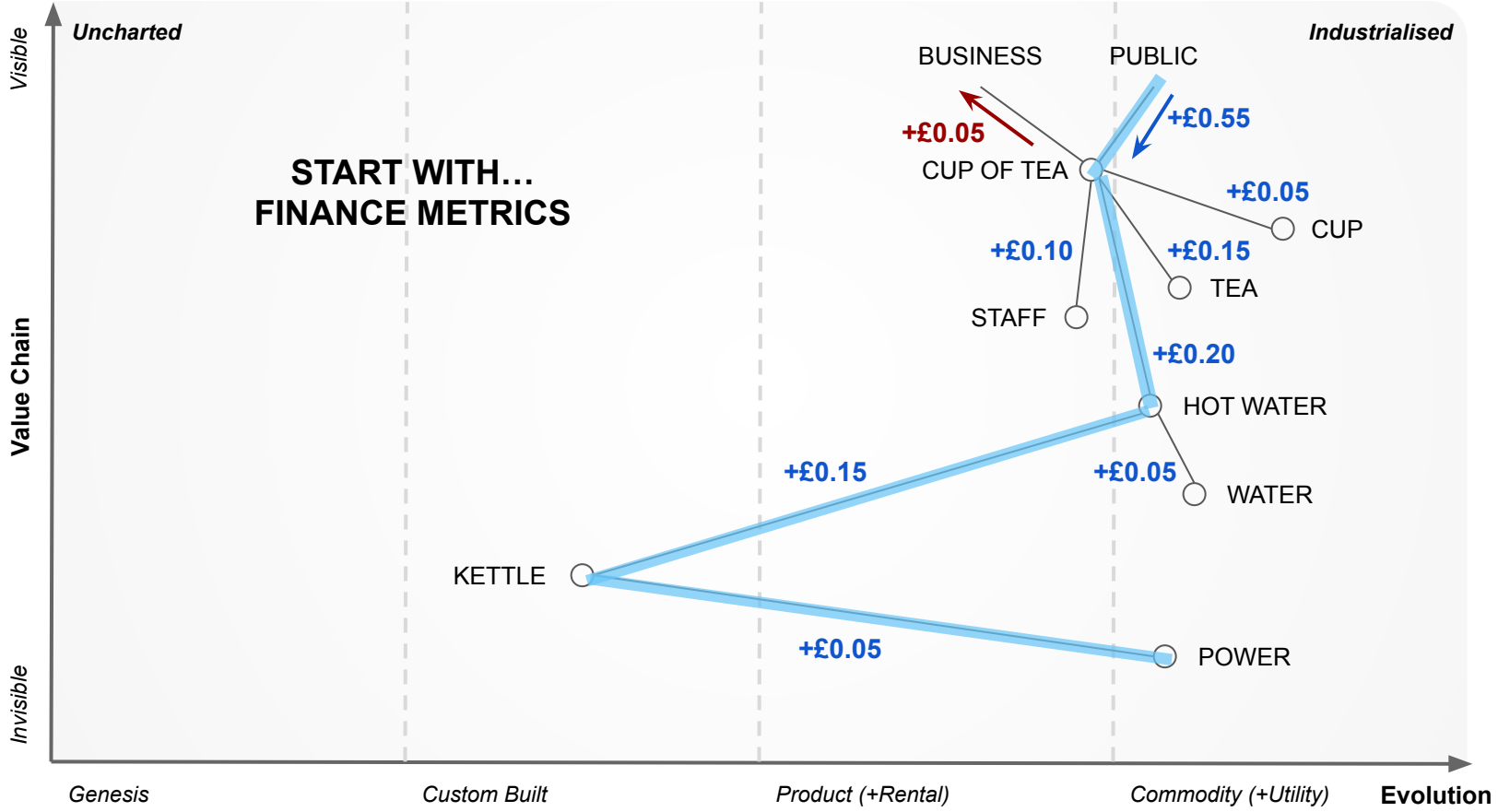


Highly commodifed

Low perceived value

Hard to displace

If emissions are “baked in”, can you do anything about it?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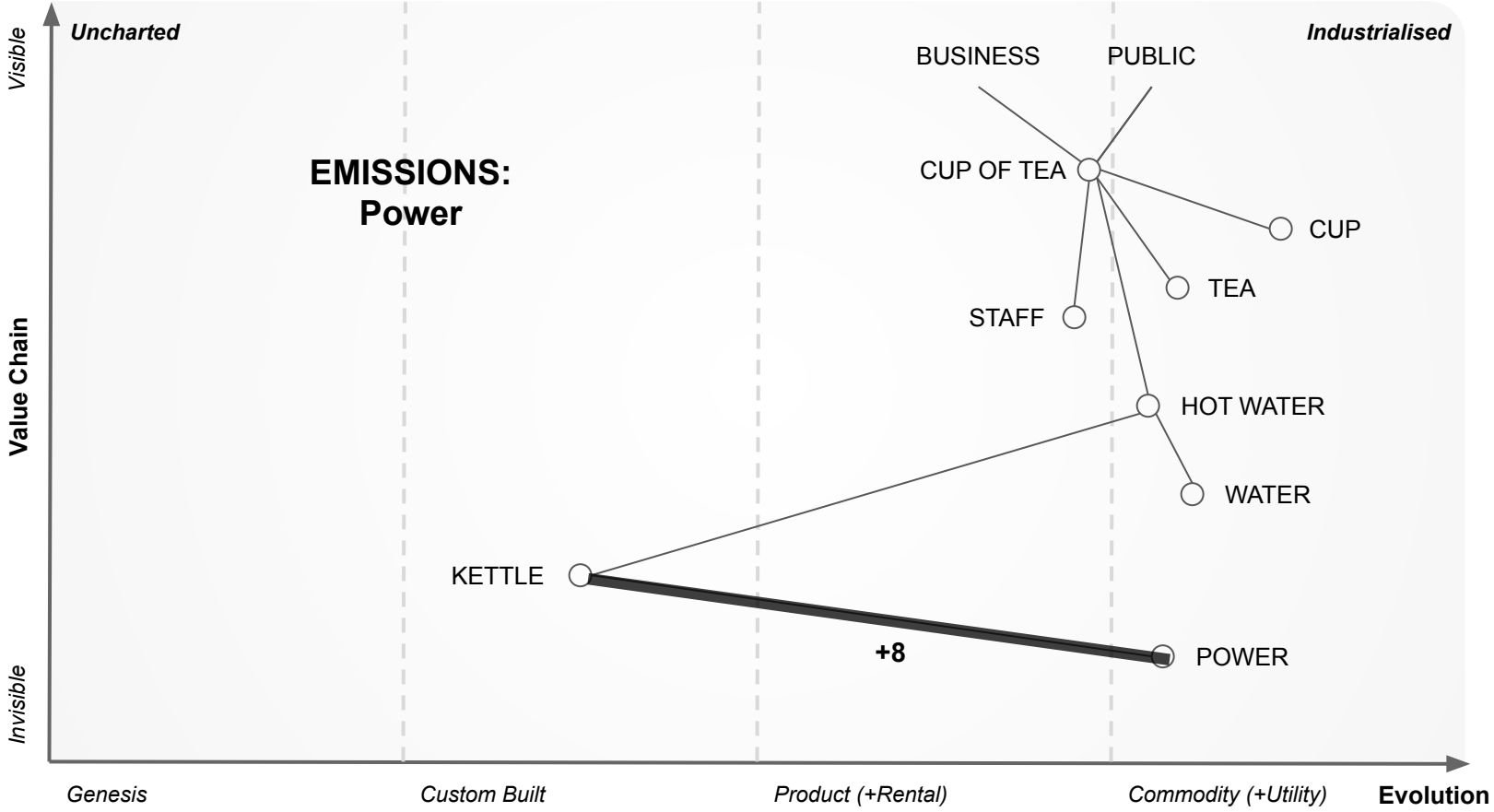
START WITH…
FINANCE METRICS
BUSINESS
PUBLIC
+£0.05
+£0.55
CUP OF TEA
+£0.05
CUP
+£0.10
+£0.15
TEA
STAFF
+£0.20
HOT WATER
+£0.15
+£0.05
WATER
KETTLE
+£0.05
POWER
Genesis
Custom Built
Product (+Rental)
Commodity (+Utility)
Evolution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EMISSIONS:
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BUSINESS
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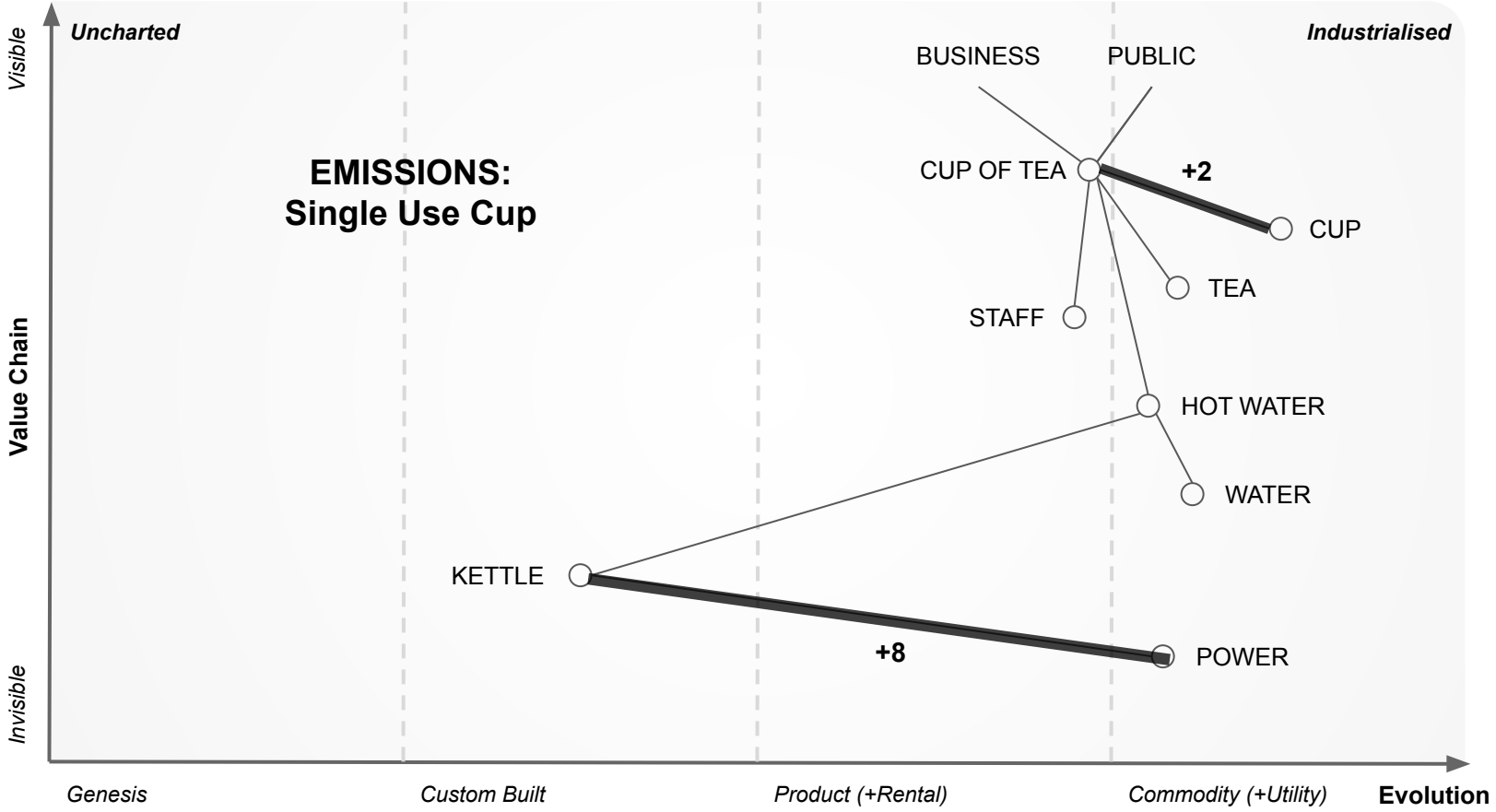
+8
POWER
Genesis
Custom Built
Product (+Rental)
Commodity (+Utility)
Evolution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Industrialised
EMISSIONS:
Single Use Cup
BUSINESS
PUBLIC
CUP OF TEA
+2
CUP
TEA
STAFF
HOT WATER
WATER
KETTLE
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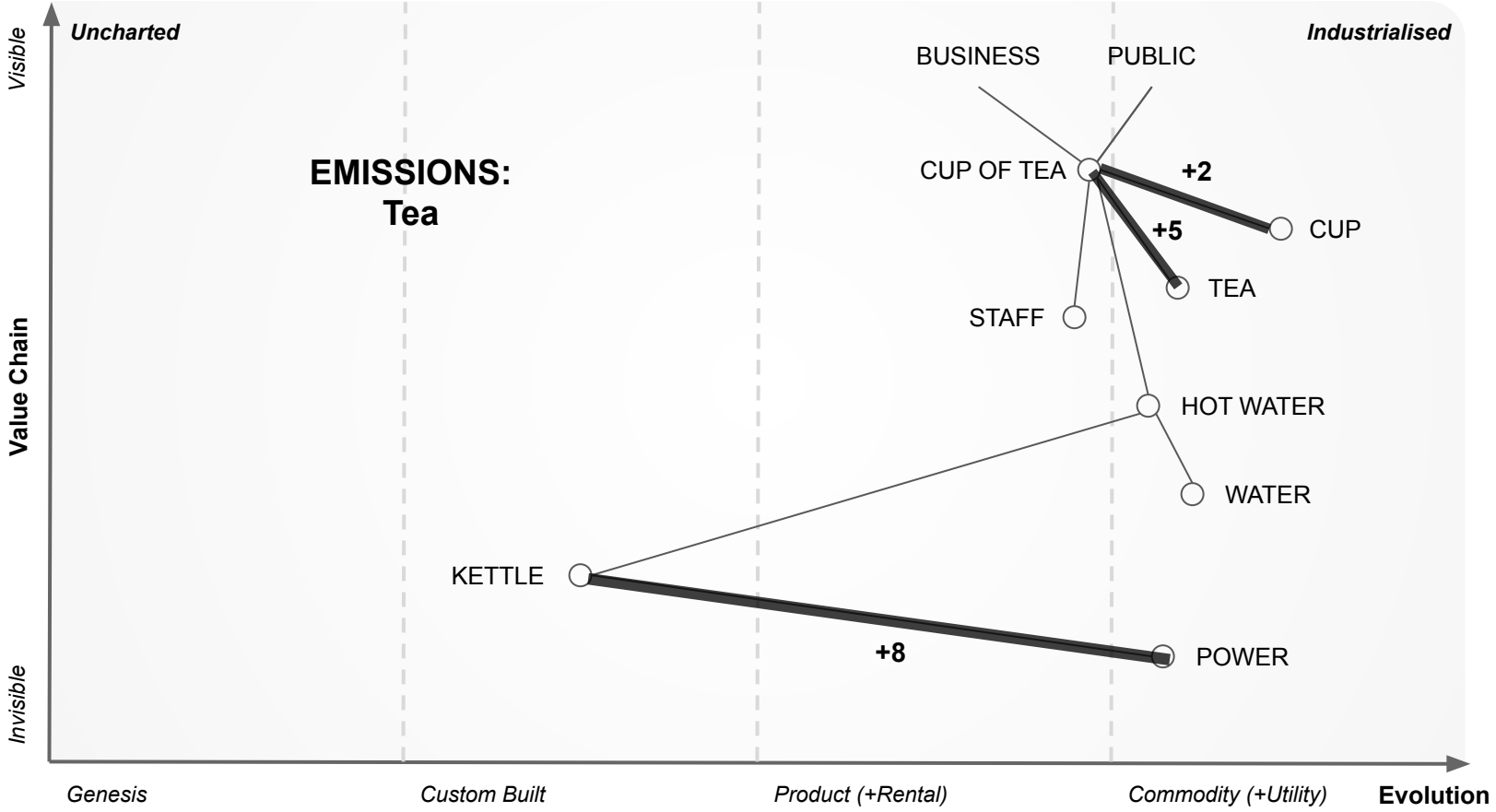
POWER
Genesis
Custom Built
Product (+Rental)
Commodity (+Utility)
Evolution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Industrialised
EMISSIONS:
Tea
BUSINESS
PUBLIC
CUP OF TEA
+2
CUP
+5
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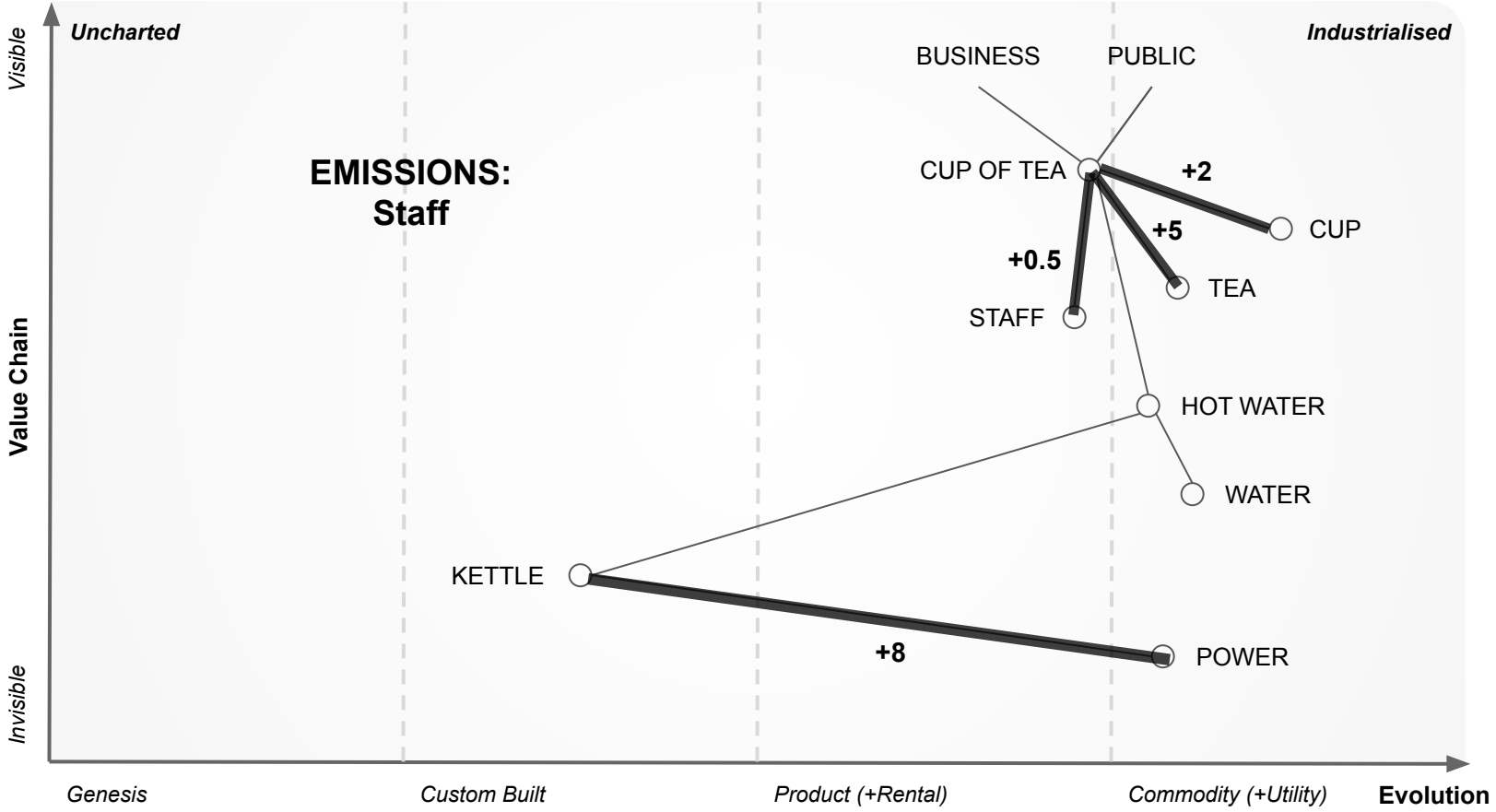
POWER
Genesis
Custom Built
Product (+Rental)
Commodity (+Utility)
Evolution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EMISSIONS:
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CUP OF TEA
+2
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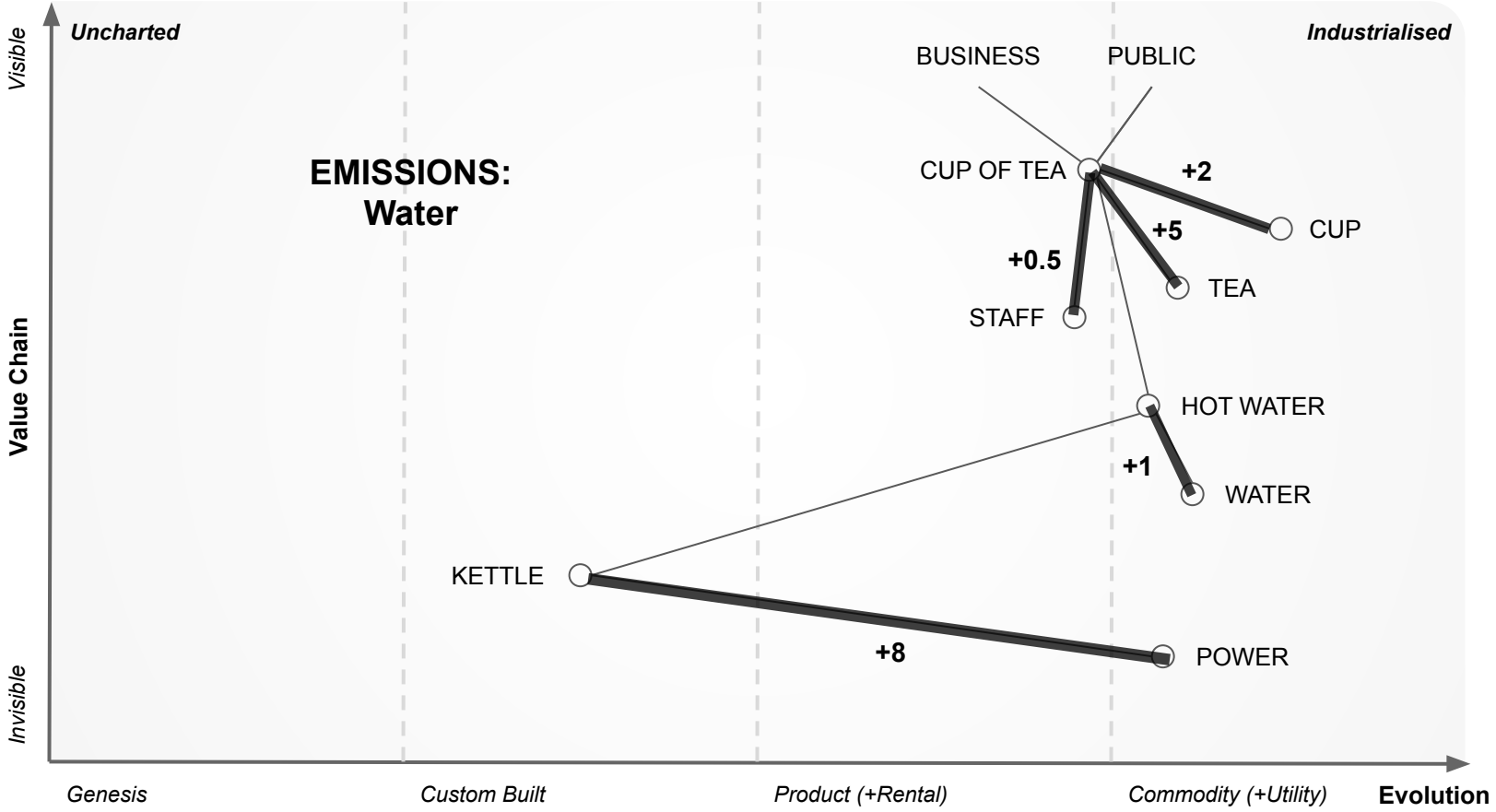
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BUSINESS
PUBLIC
CUP OF TEA
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+0.5
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HOT WATER
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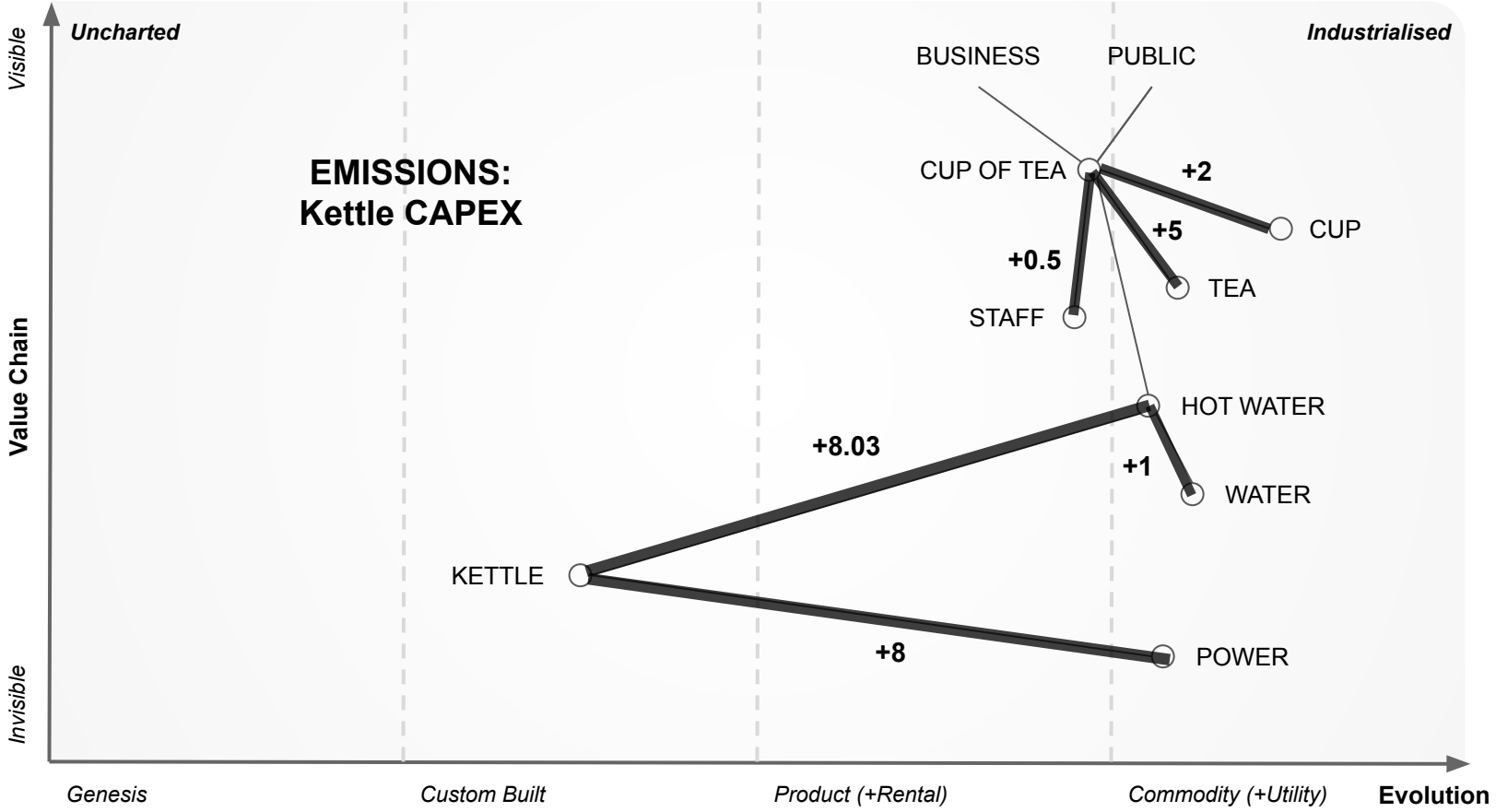
Evolution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Kettle CAPEX
BUSINESS
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TEA
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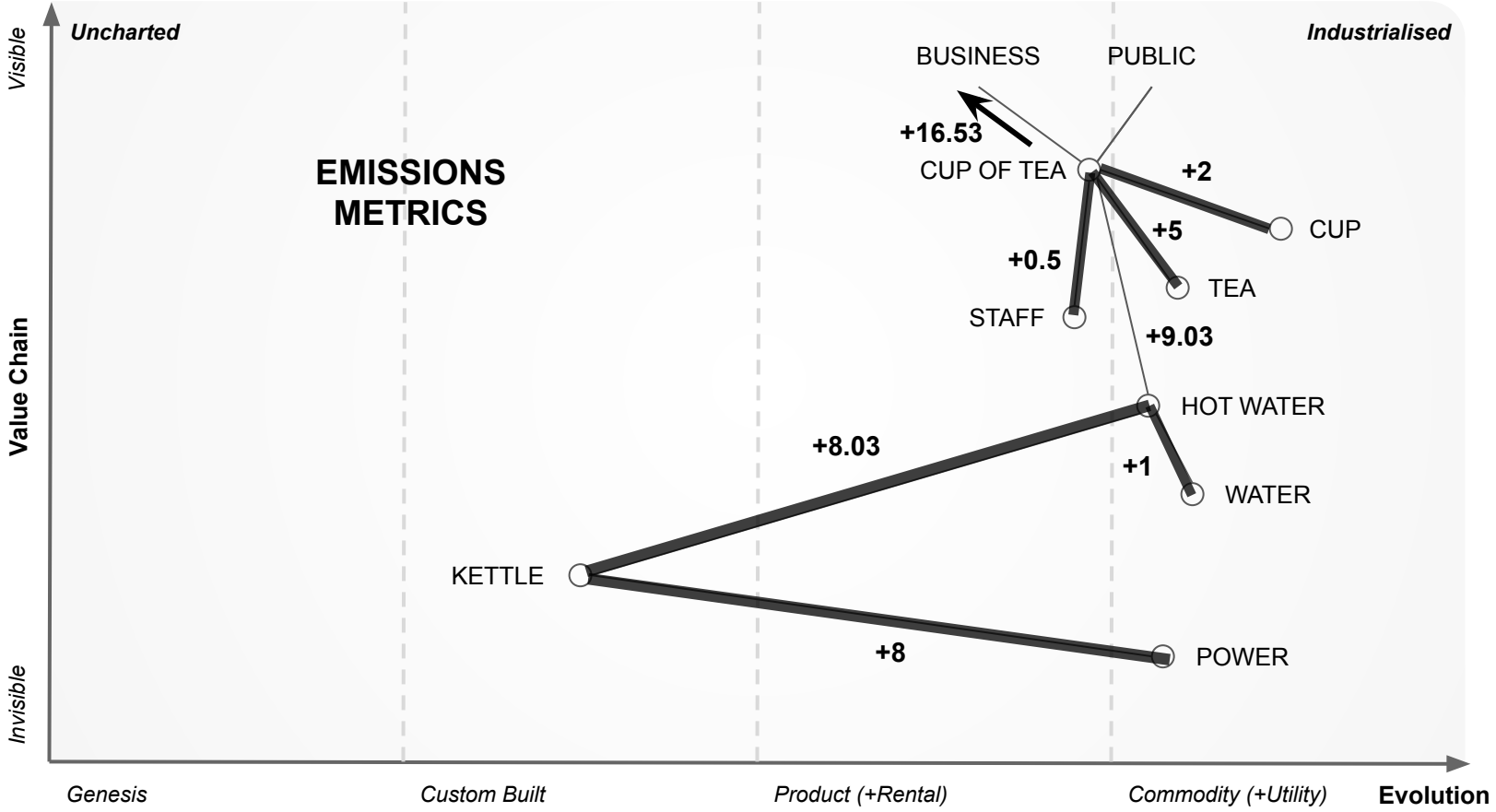
Commodity (+Utility)
Evolution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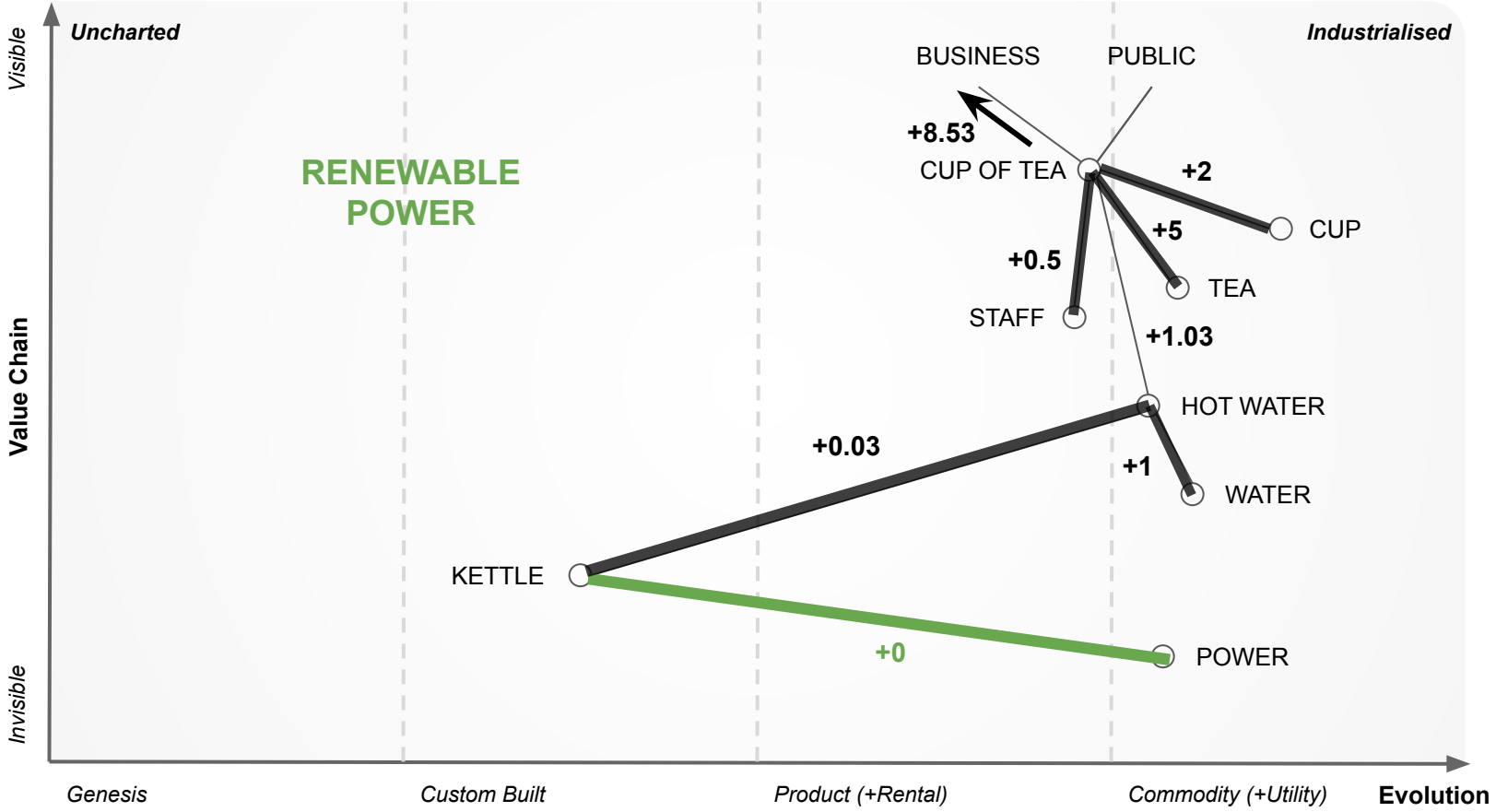
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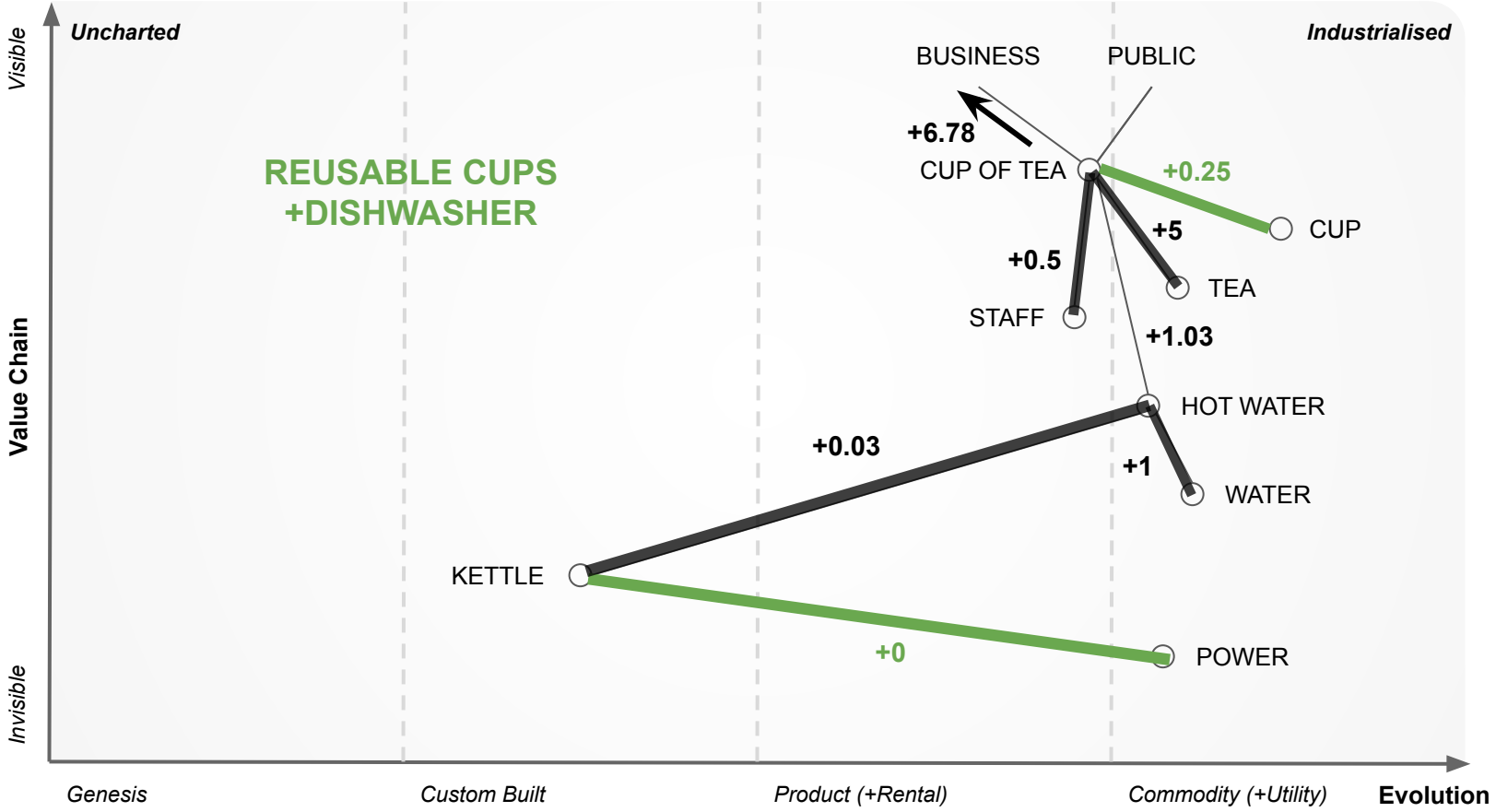
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+DISHWASHER
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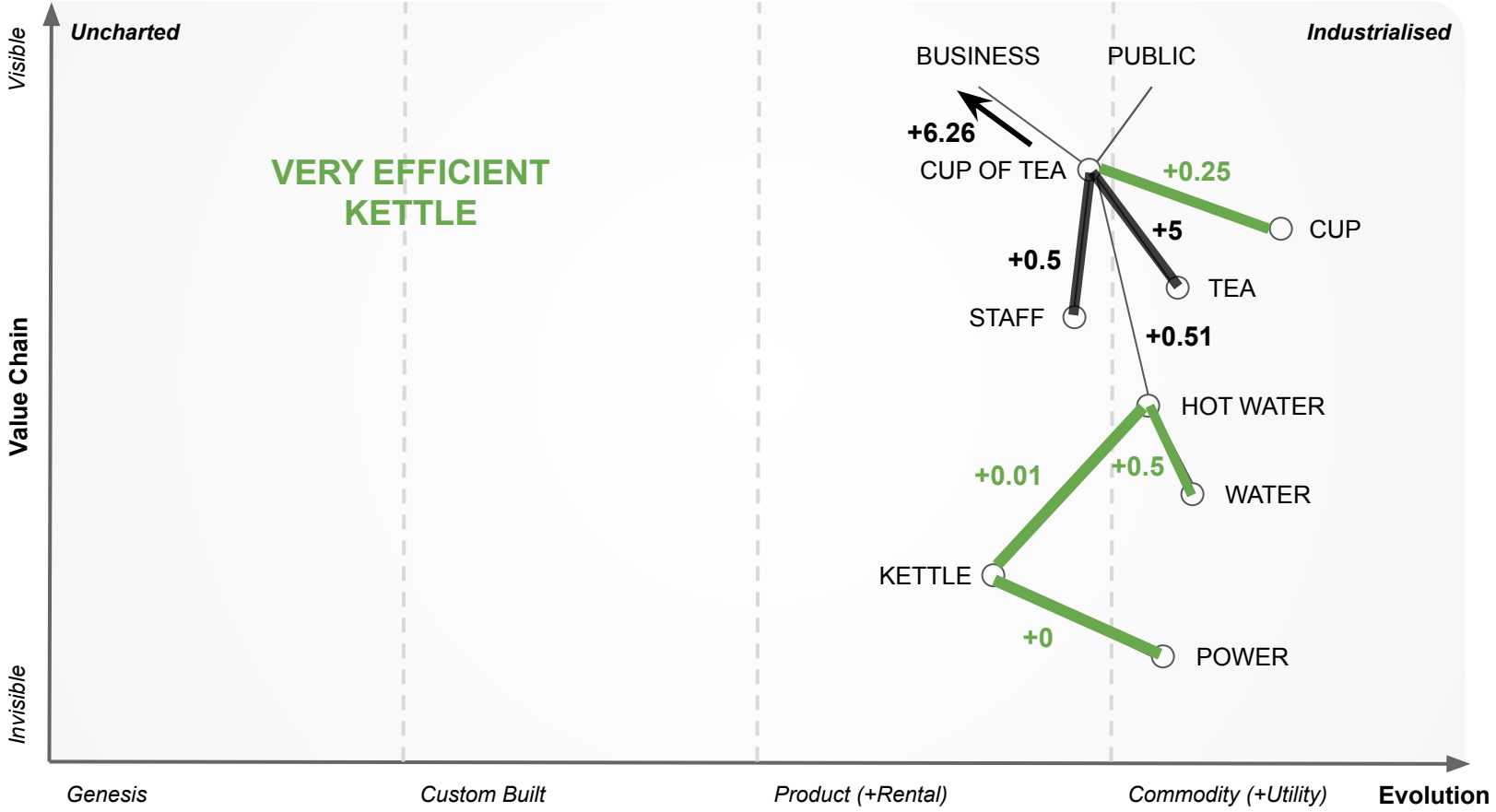
Commodity (+Utility)
Evolution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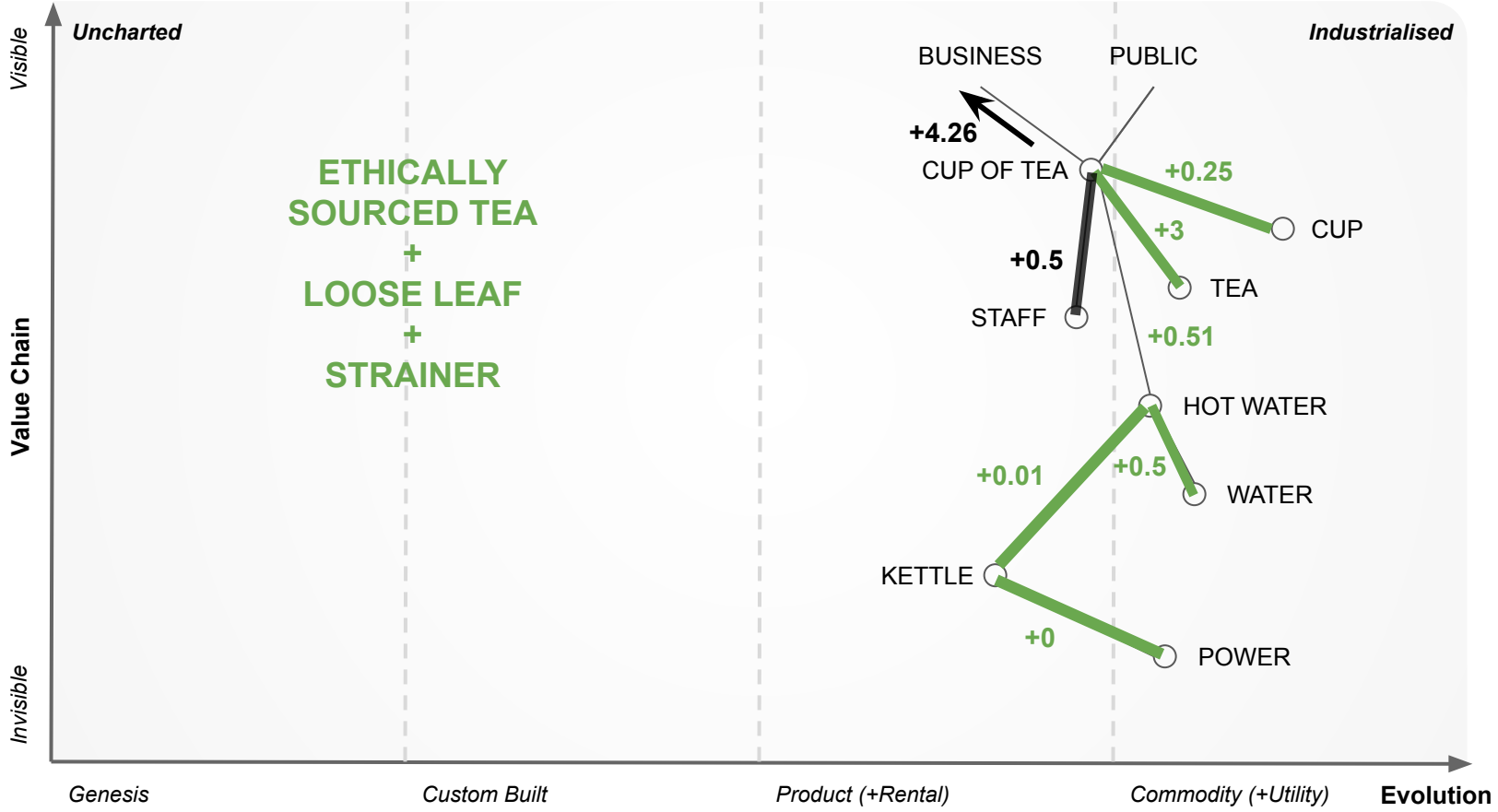
Commodity (+Utility)
Evolution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+
LOOSE LEAF
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STRAINER
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+4.26
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TEA
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STAFF
+0.51
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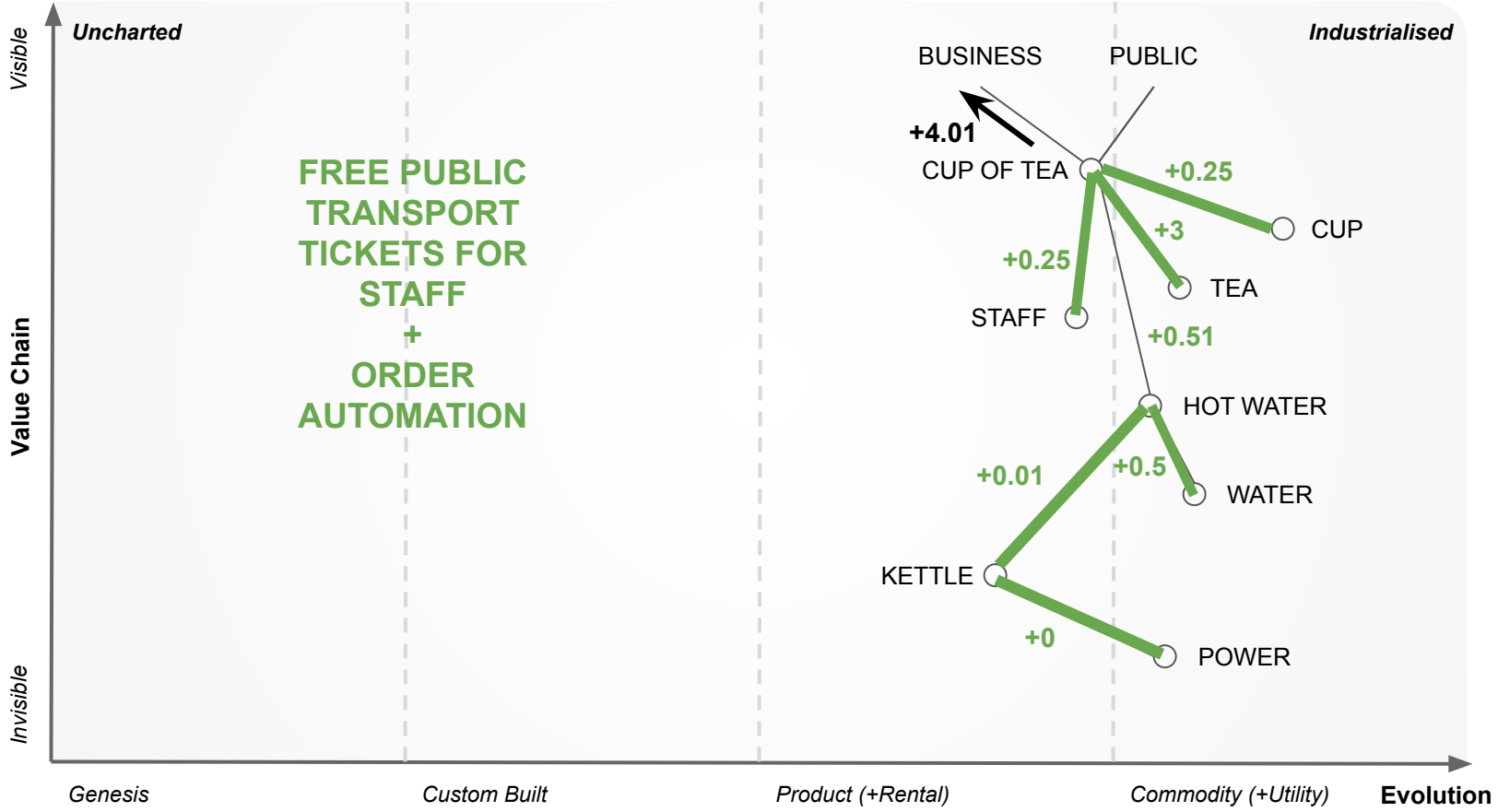
Commodity (+Utility)
Evolution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FREE PUBLIC TRANSPORT TICKETS FOR STAFF + ORDER AUTOMATION
BUSINESS
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CUP
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TEA
+0.25
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HOT WATER
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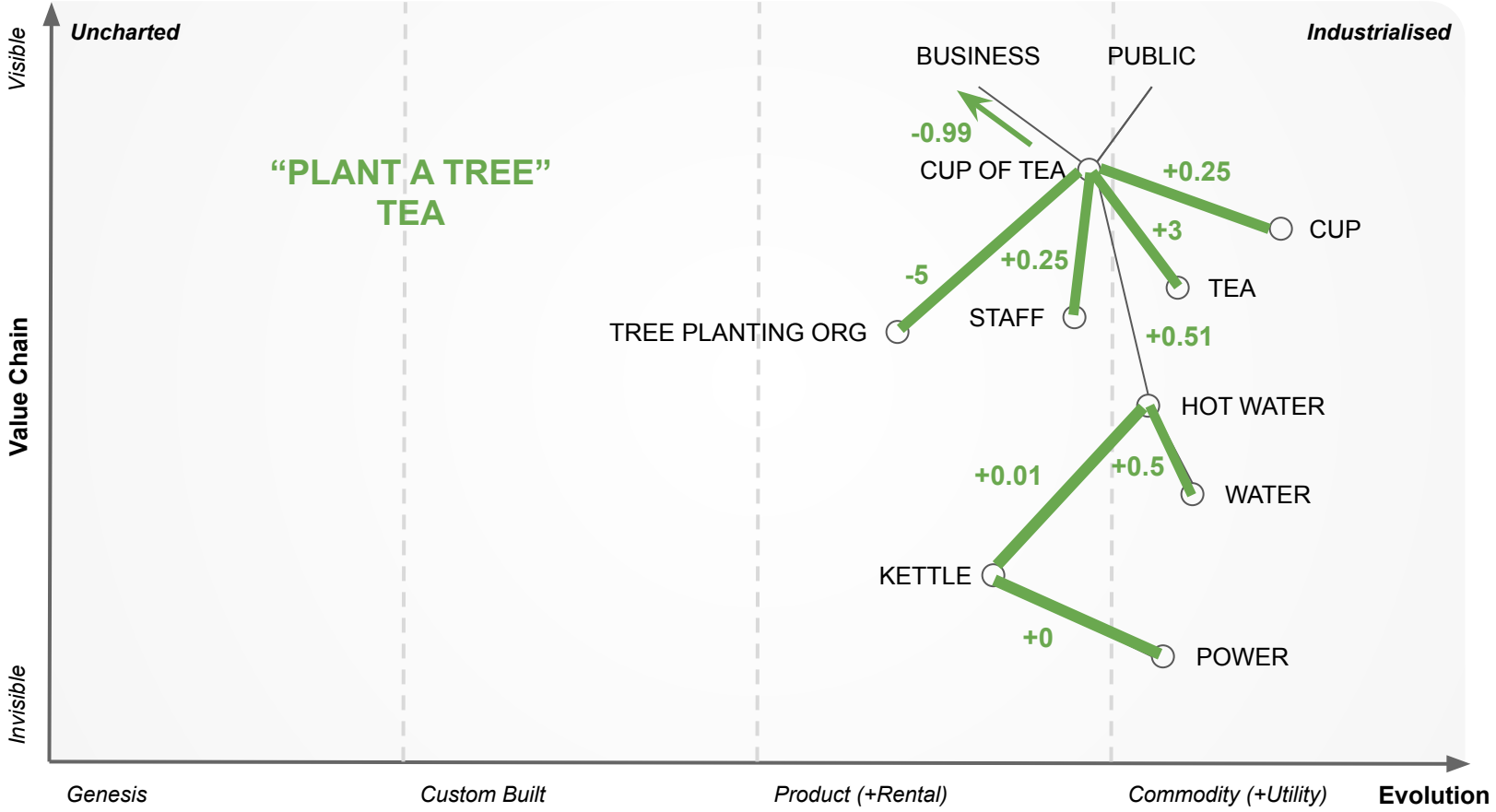
Product (+Rental)
Commodity (+Utility)
Evolution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Industrialised
"PLANT A TREE"
TEA
BUSINESS
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-0.99
CUP OF TEA
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STAFF
TREE PLANTING ORG
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HOT WATER
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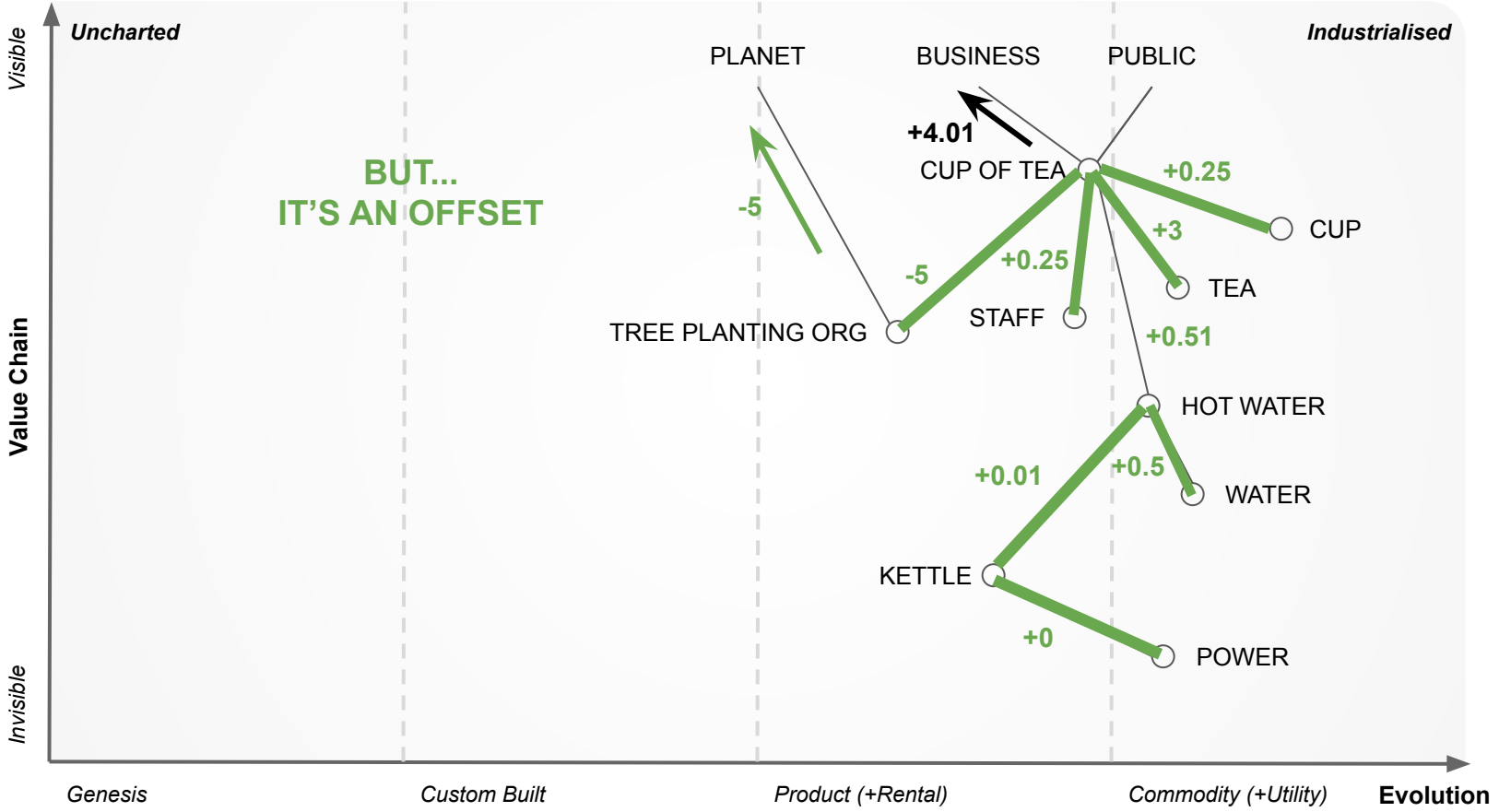
Commodity (+Utility)
Evolution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BUSINESS
PUBLIC
BUT...
IT'S AN OFFSET
+4.01
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-5
+0.25
CUP
+3
TEA
-5
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STAFF
TREE PLANTING ORG
+0.51
HOT WATER
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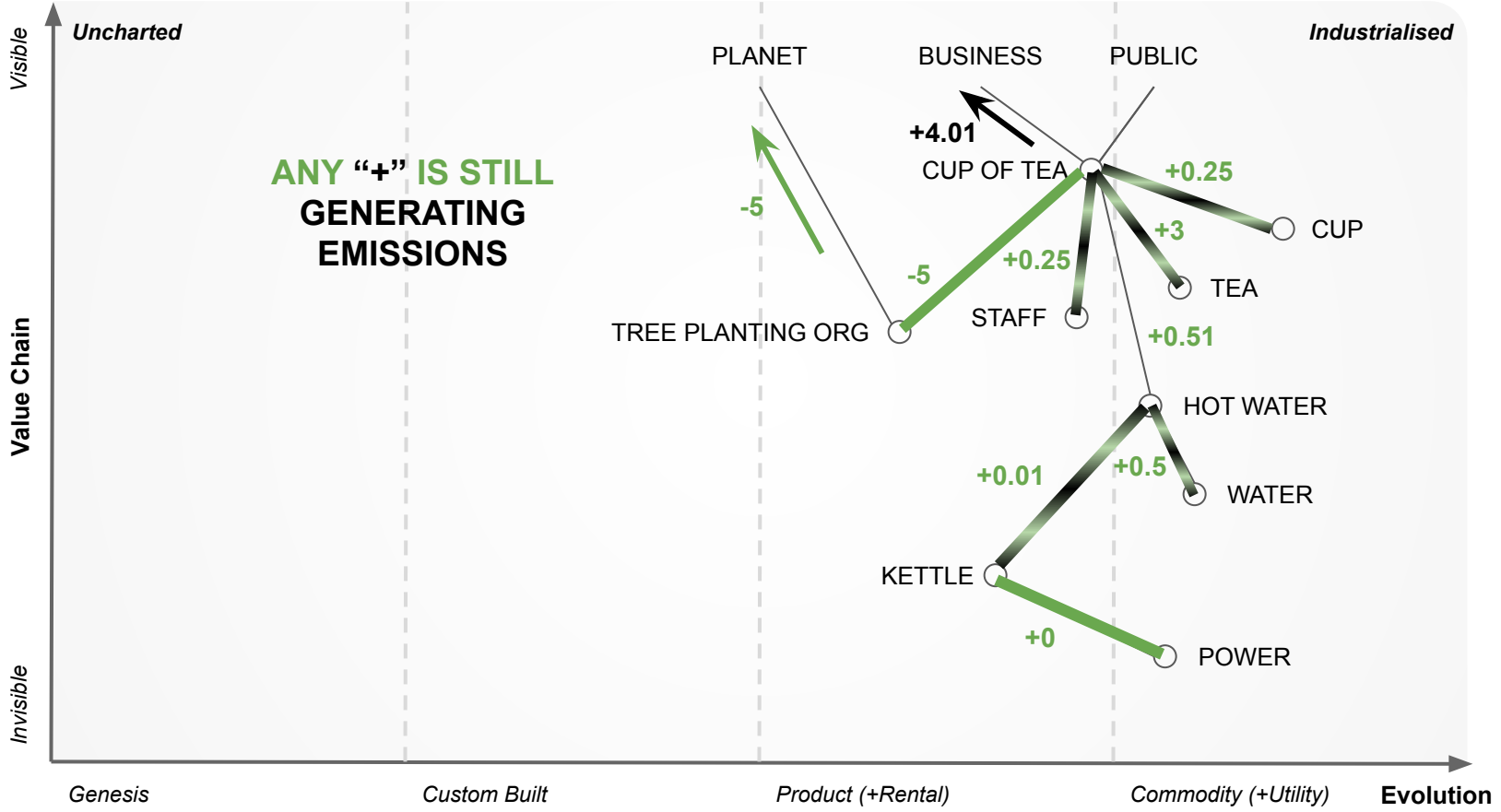
Commodity (+Utility)
Evolution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ANY "+" IS STILL GENERATING EMISSIONS
PLANET
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-5
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CUP
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TEA
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TREE PLANTING ORG
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HOT WATER
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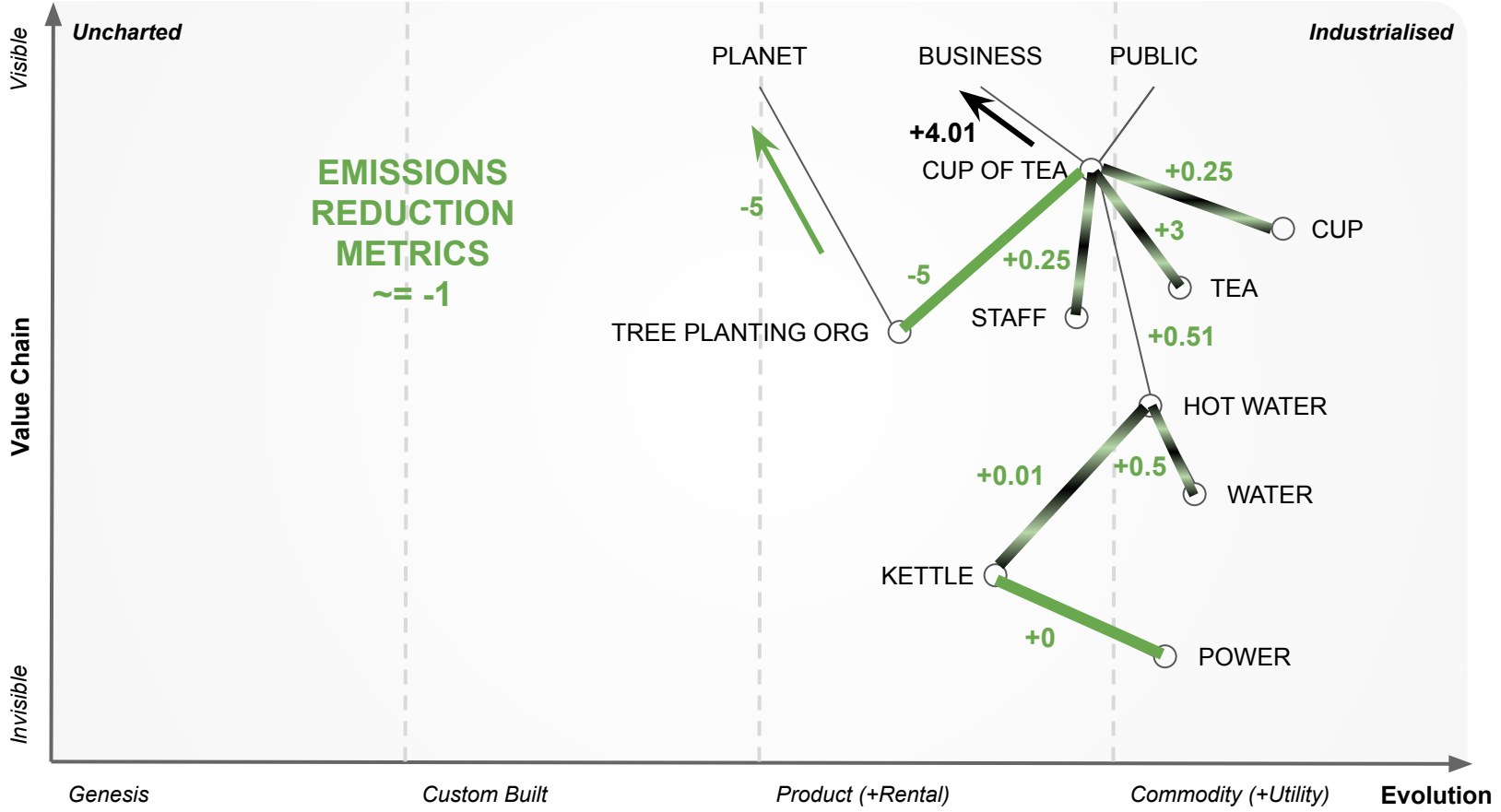
Commodity (+Utility)
Evolution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METRICS
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CUP
+3
TEA
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STAFF
TREE PLANTING ORG
+0.51
HOT WATER
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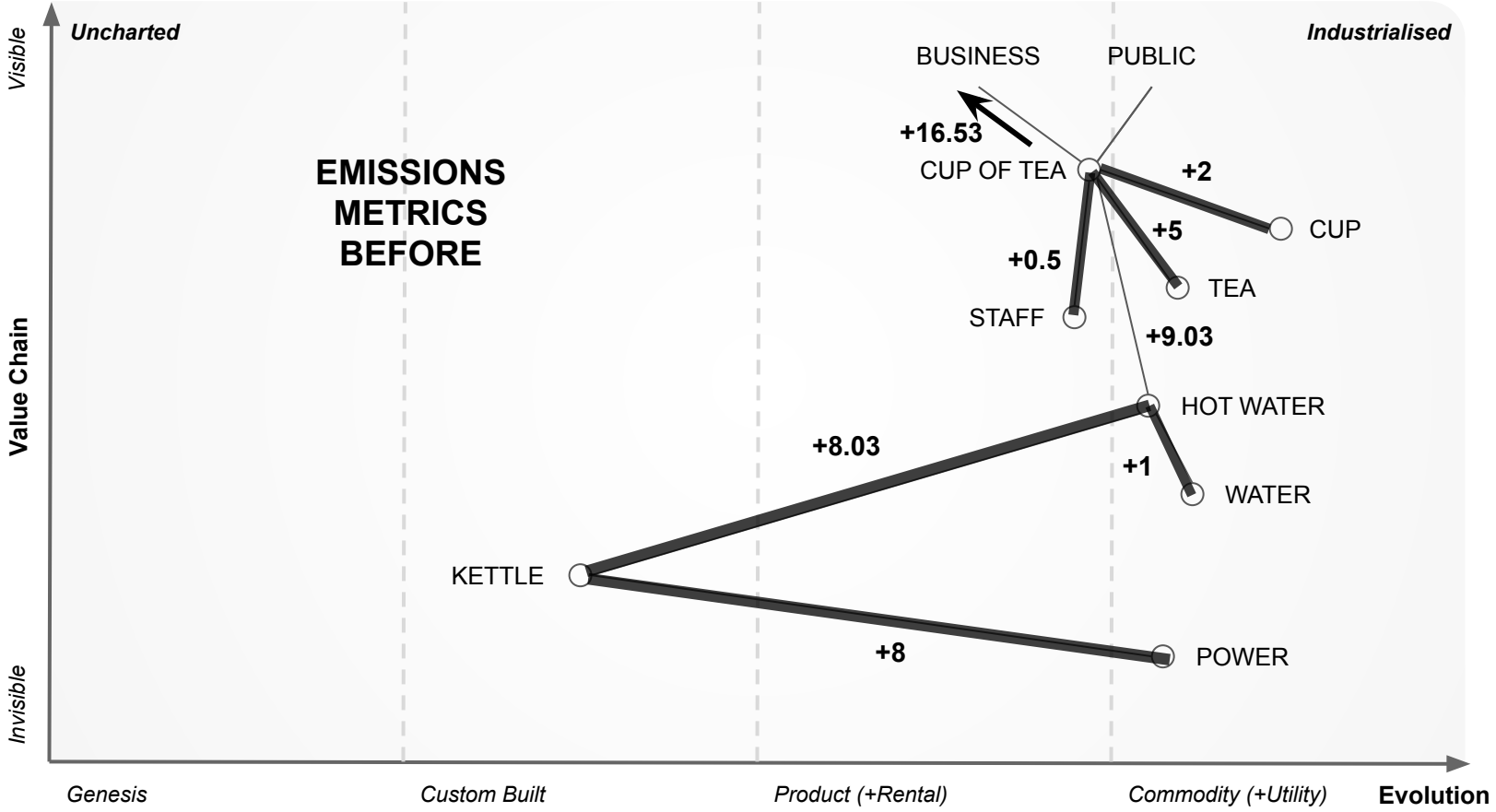
Commodity (+Utility)
Evolution


Visible
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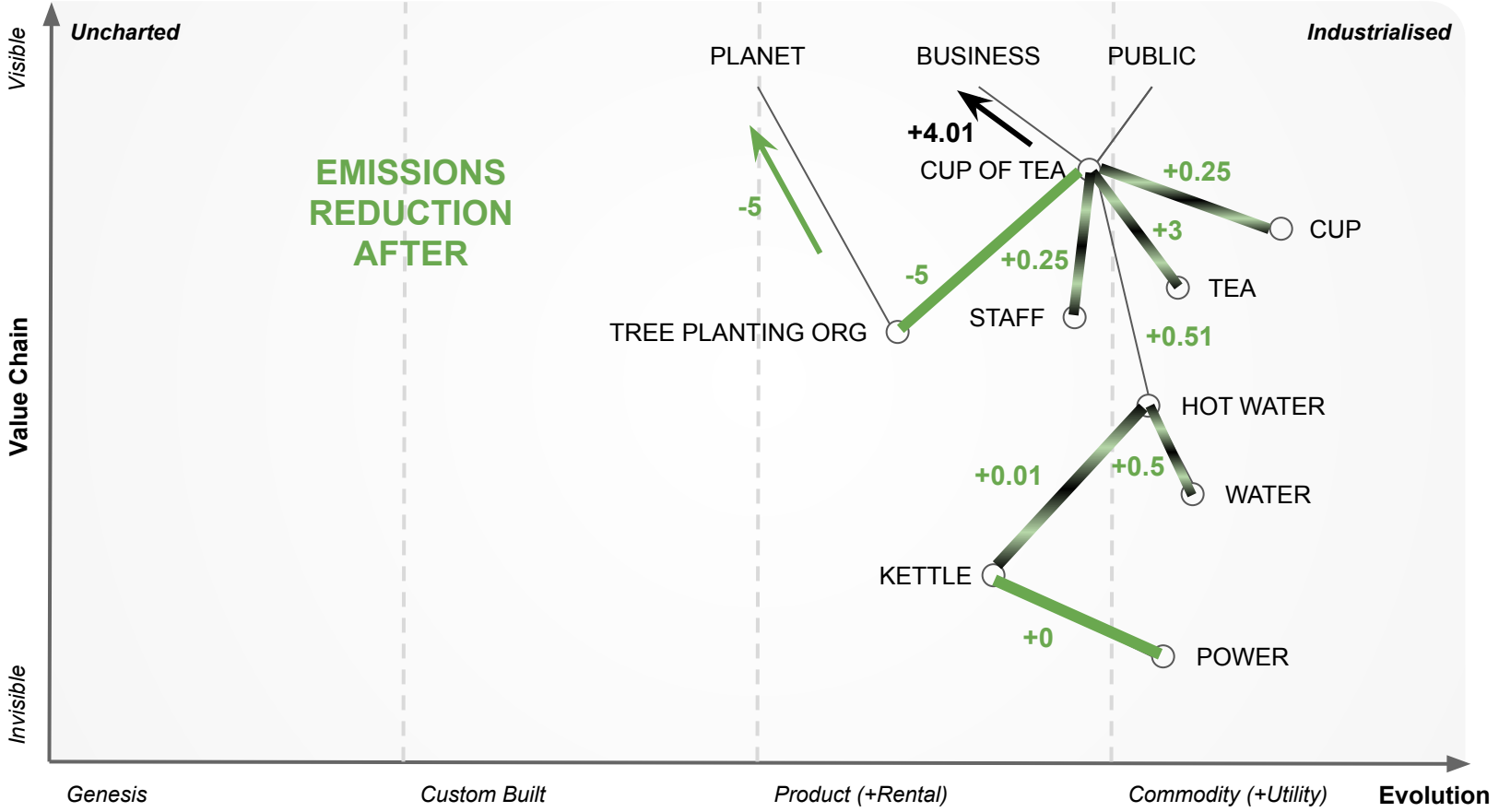
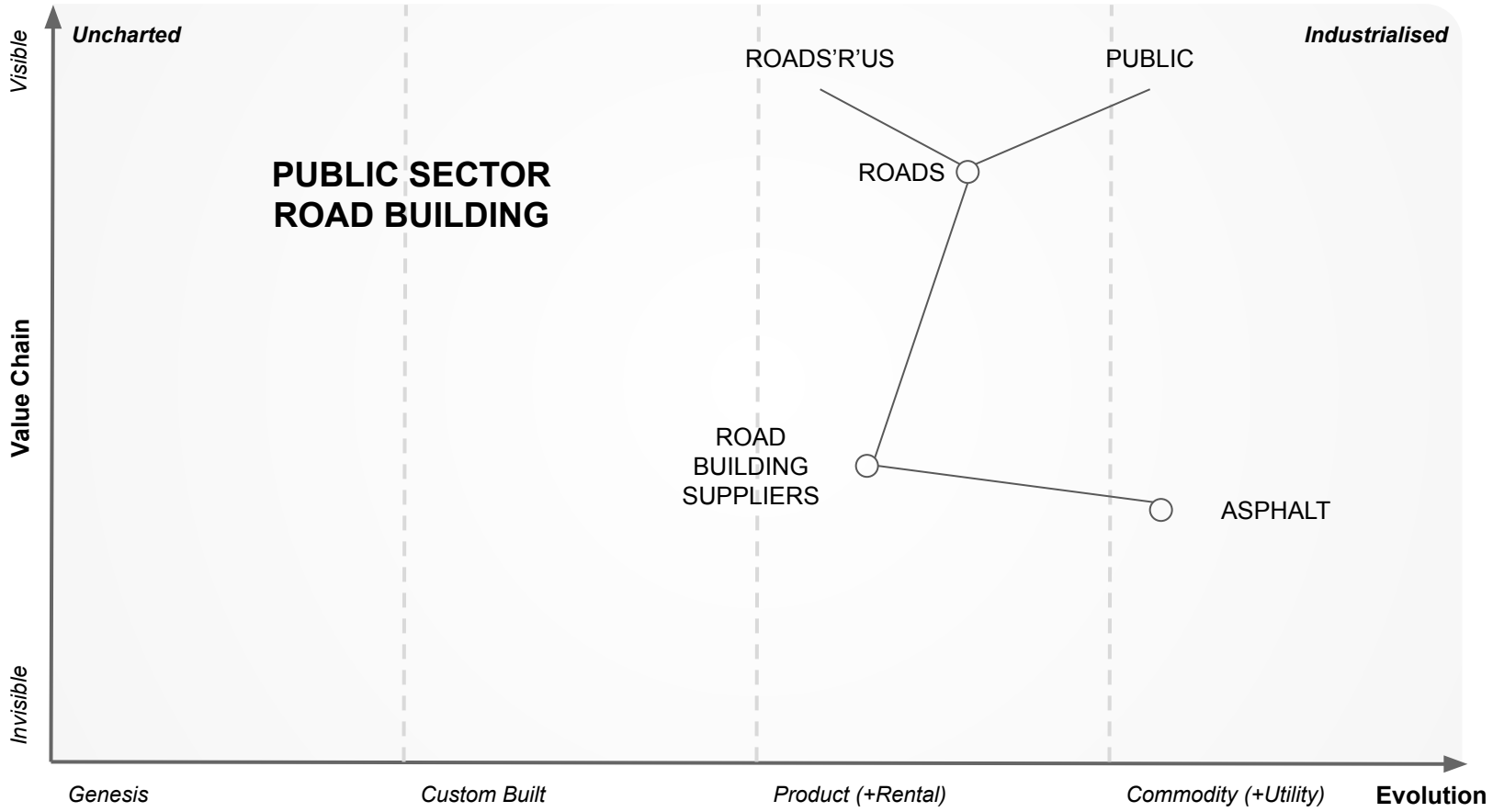
EMISSIONS
METRICS
BEFORE
BUSINESS
PUBLIC
+16.53
CUP OF TEA
+2
CUP
+5
TEA
+0.5
STAFF
+9.03
HOT WATER
+8.03
+1
WATER
KETTLE
+8
POWER
Genesis
Custom Built
Product (+Rental)
Commodity (+Utility)
Evolution


Visible
Value Chain
Invisible
Uncharted
Industrialised
EMISSIONS REDUCTION AFTER
PLANET
BUSINESS
PUBLIC
+4.01
CUP OF TEA
-5
+0.25
CUP
+3
TEA
-5
+0.25
STAFF
TREE PLANTING ORG
+0.51
HOT WATER
+0.01
+0.5
WATER
KETTLE
+0
POWER
Genesis
Custom Built
Product (+Rental)
Commodity (+Utility)
Evolution

What about the real world?

(It’s not all “cups of tea” is it!)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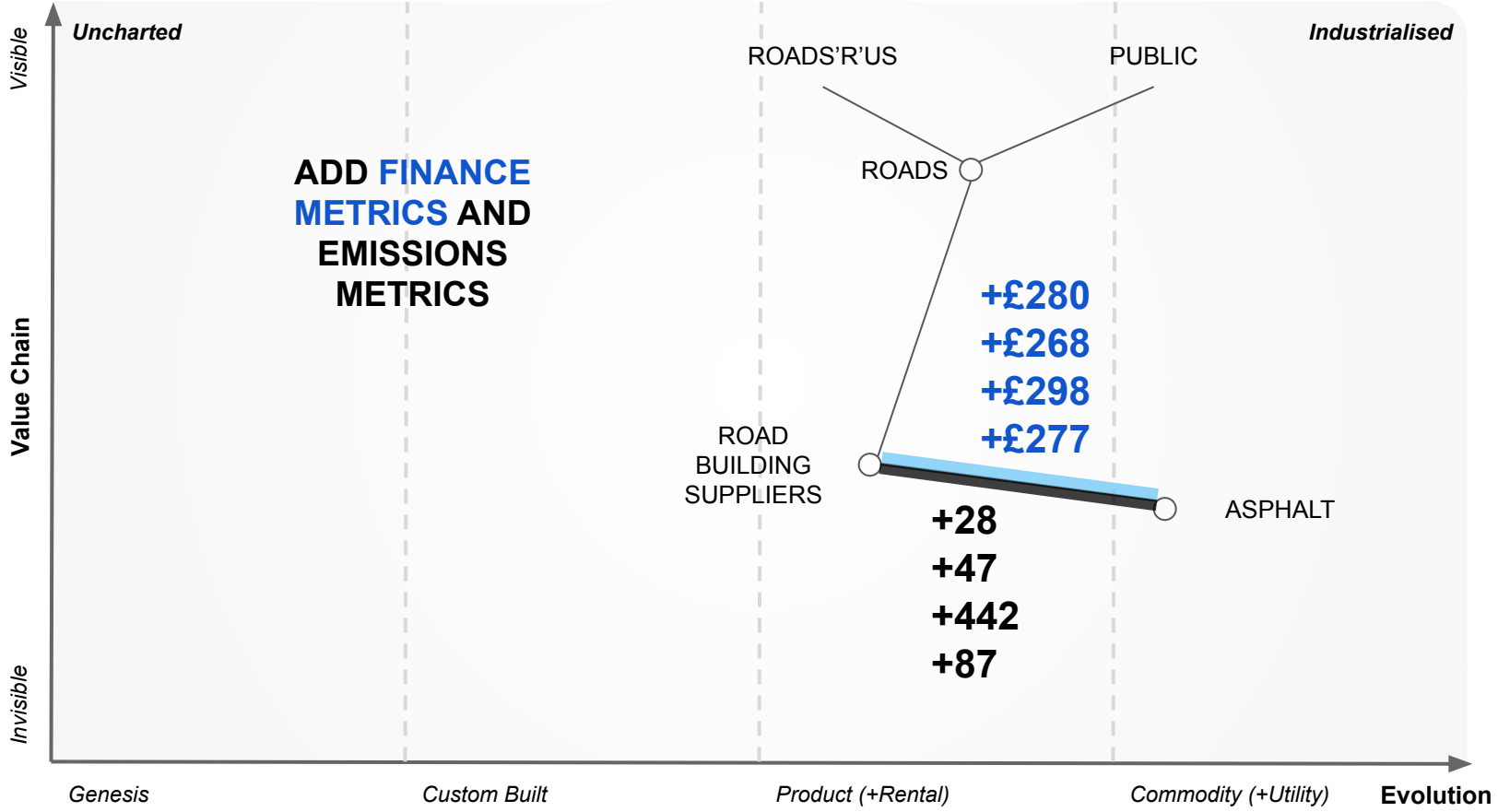
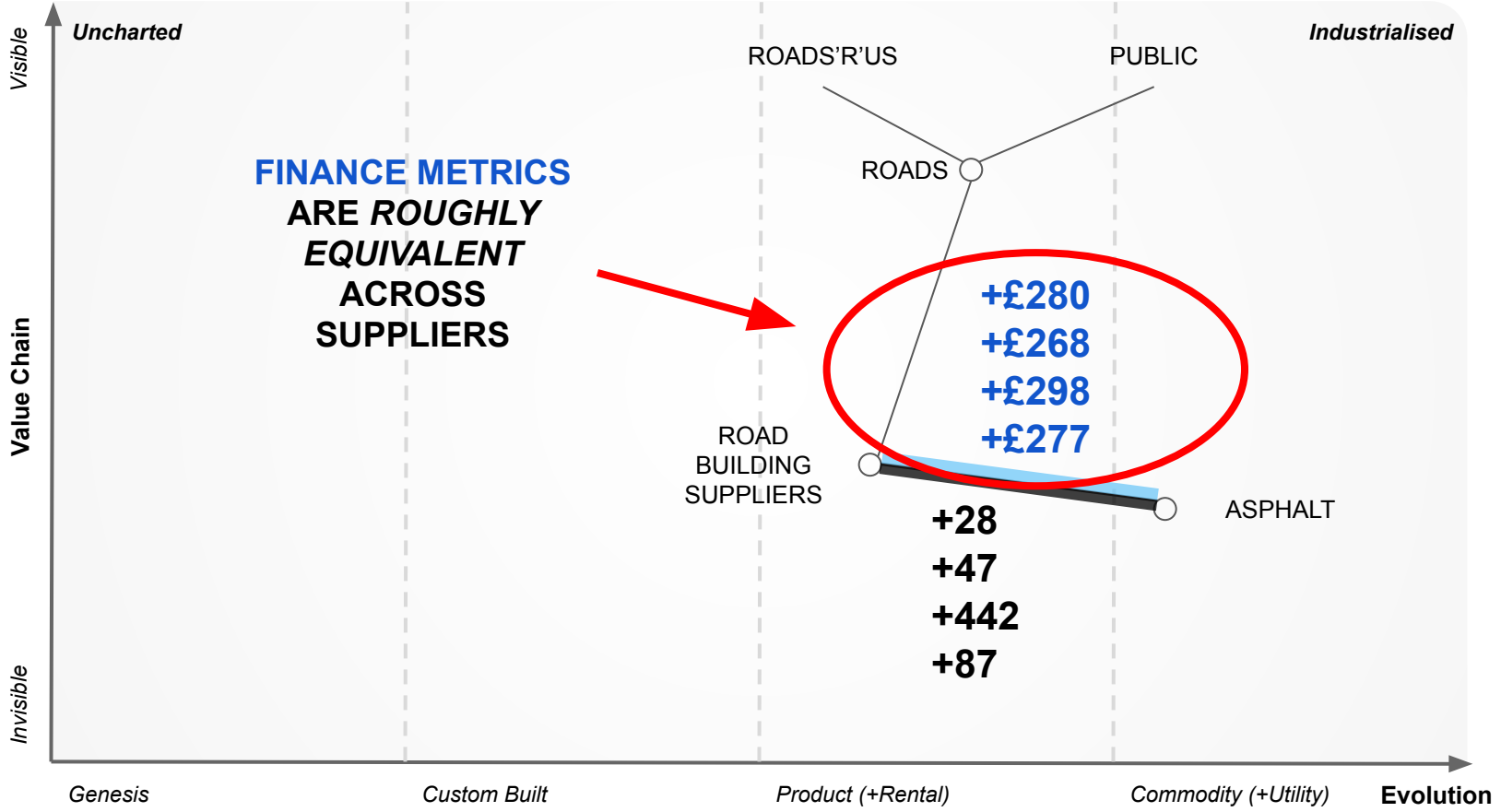
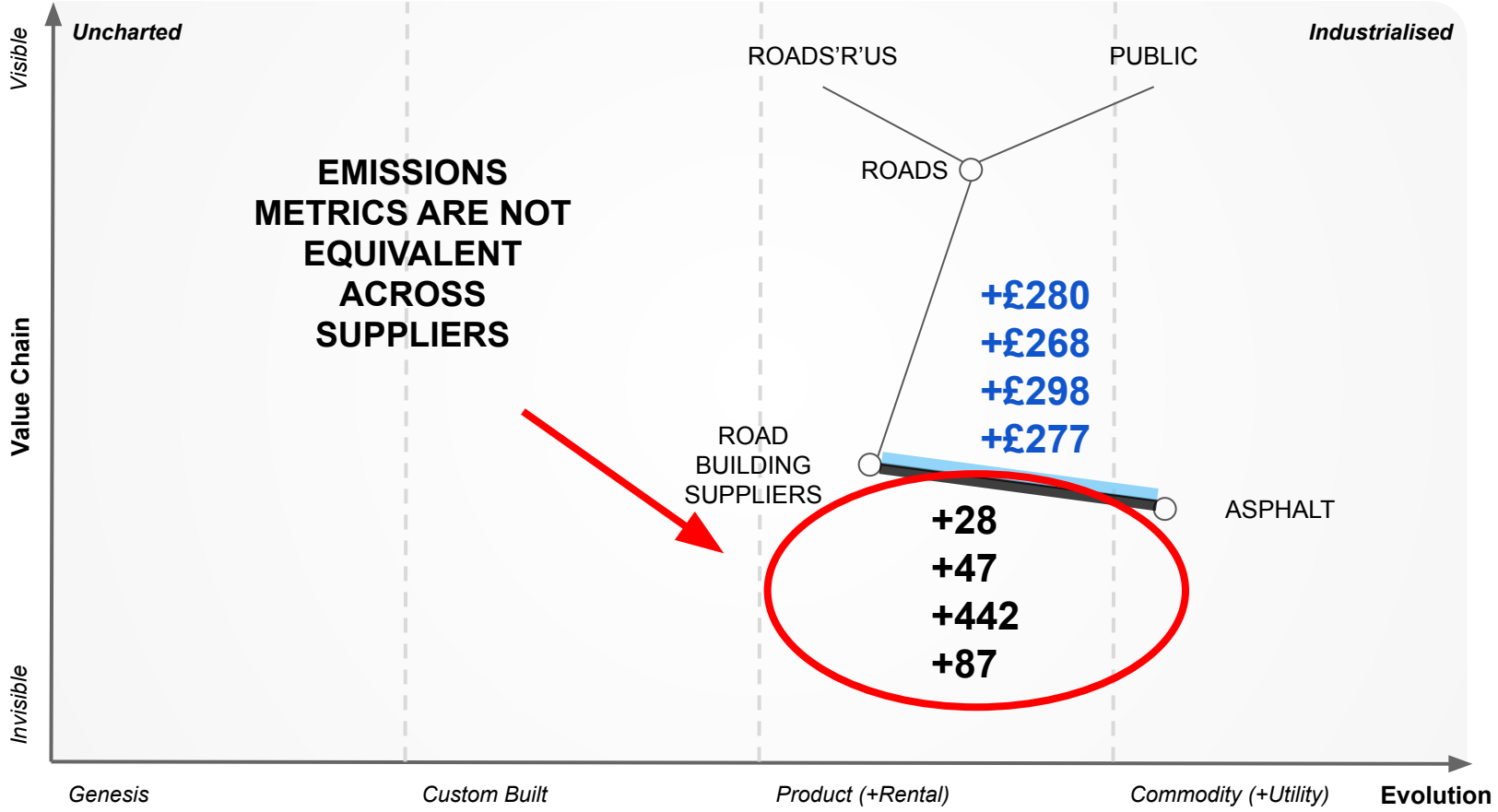
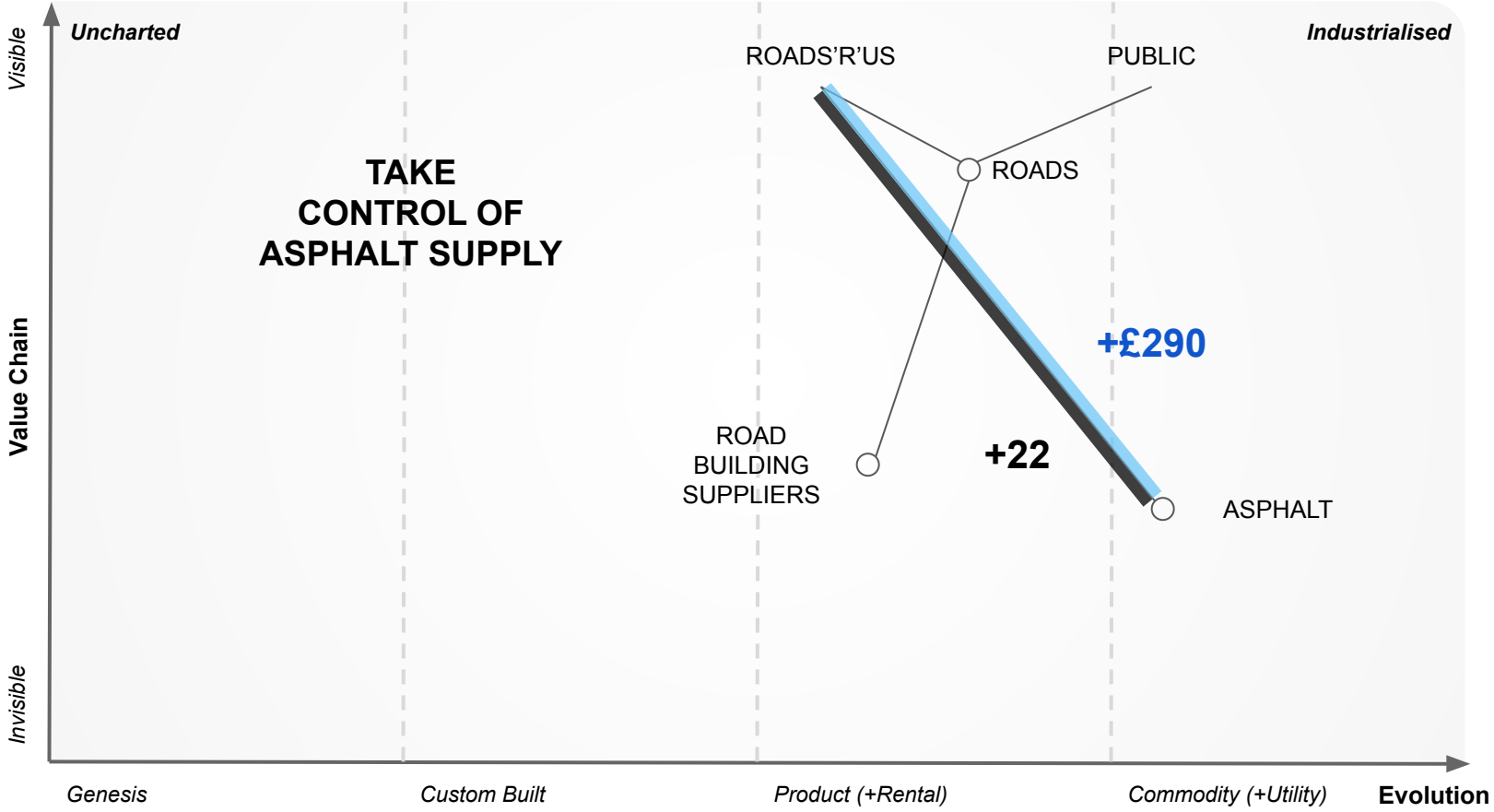
Value Chain
Uncharted
Industrialised
PUBLIC SECTOR
ROAD BUILDING
ROADS'R'US
PUBLIC
ROADS
ROAD
BUILDING
SUPPLIERS
ASPHALT
Genesis
Custom Built
Product (+Rental)
Commodity (+Utility)
Evolution

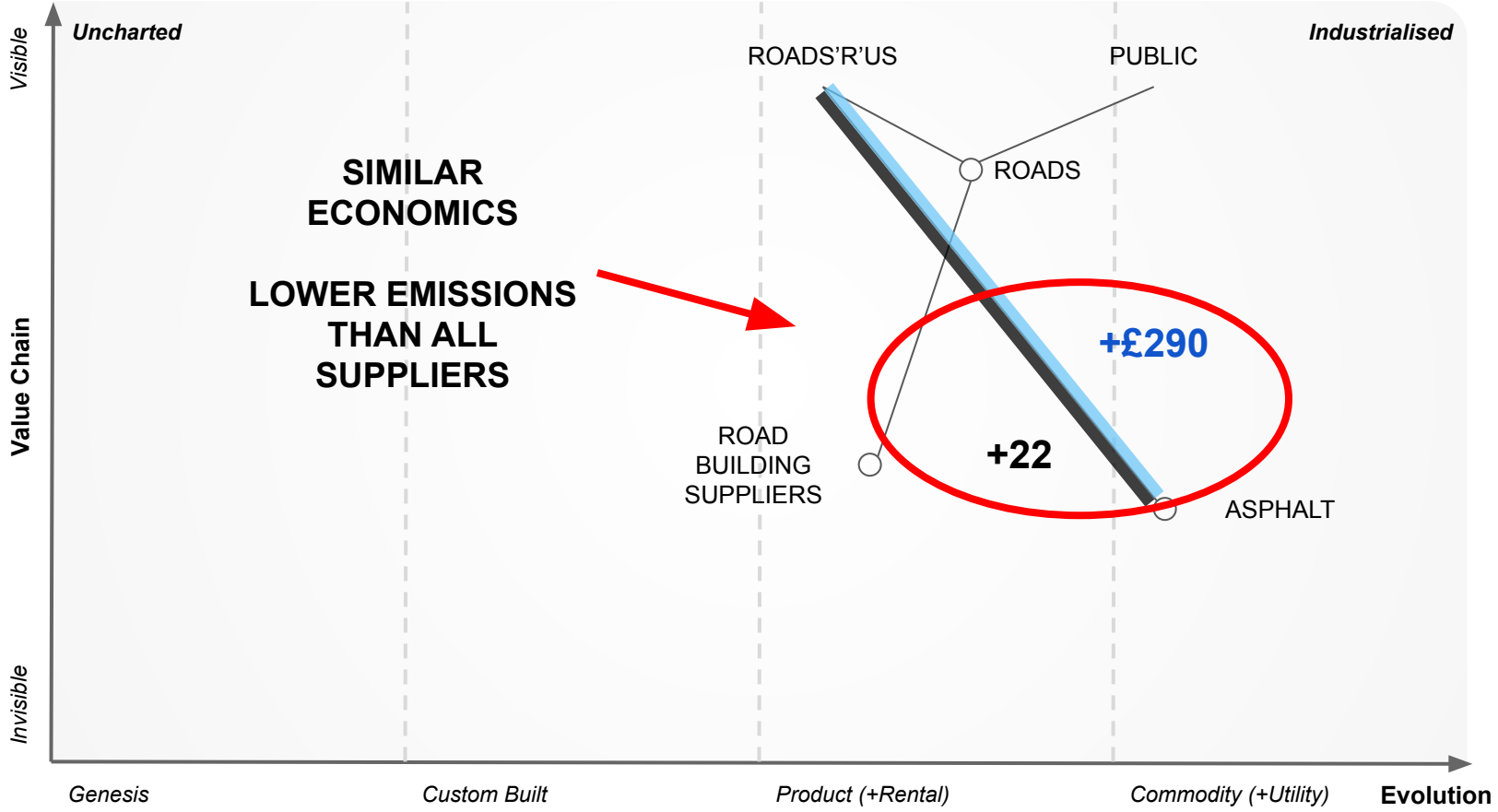

Visible
Invisible
Value Chain
Uncharted
Industrialised
ADD FINANCE METRICS AND EMISSIONS METRICS
ROADS'R'US
PUBLIC
ROADS
+£280
+£268
+£298
+£277
ROAD BUILDING SUPPLIERS
ASPHALT
+28
+47
+442
+87
Genesis
Custom Built
Product (+Rental)
Commodity (+Utility)
Evolution


Visible
Invisible
Value Chain
Uncharted
Industrialised
FINANCE METRICS
ARE ROUGHLY
EQUIVALENT
ACROSS
SUPPLIERS
ROADS'R'US
PUBLIC
ROADS
+£280
+£268
+£298
+£277
ROAD
BUILDING
SUPPLIERS
ASPHALT
+28
+47
+442
+87
Genesis
Custom Built
Product (+Rental)
Commodity (+Utility)
Evolution


Visible
Invisible
Value Chain
Uncharted
Industrialised
EMISSIONS METRICS ARE NOT EQUIVALENT ACROSS SUPPLIERS
ROADS'R'US
PUBLIC
ROADS
+£280
+£268
+£298
+£277
ROAD BUILDING SUPPLIERS
ASPHALT
+28
+47
+442
+87
Genesis
Custom Built
Product (+Rental)
Commodity (+Utility)
Evolution

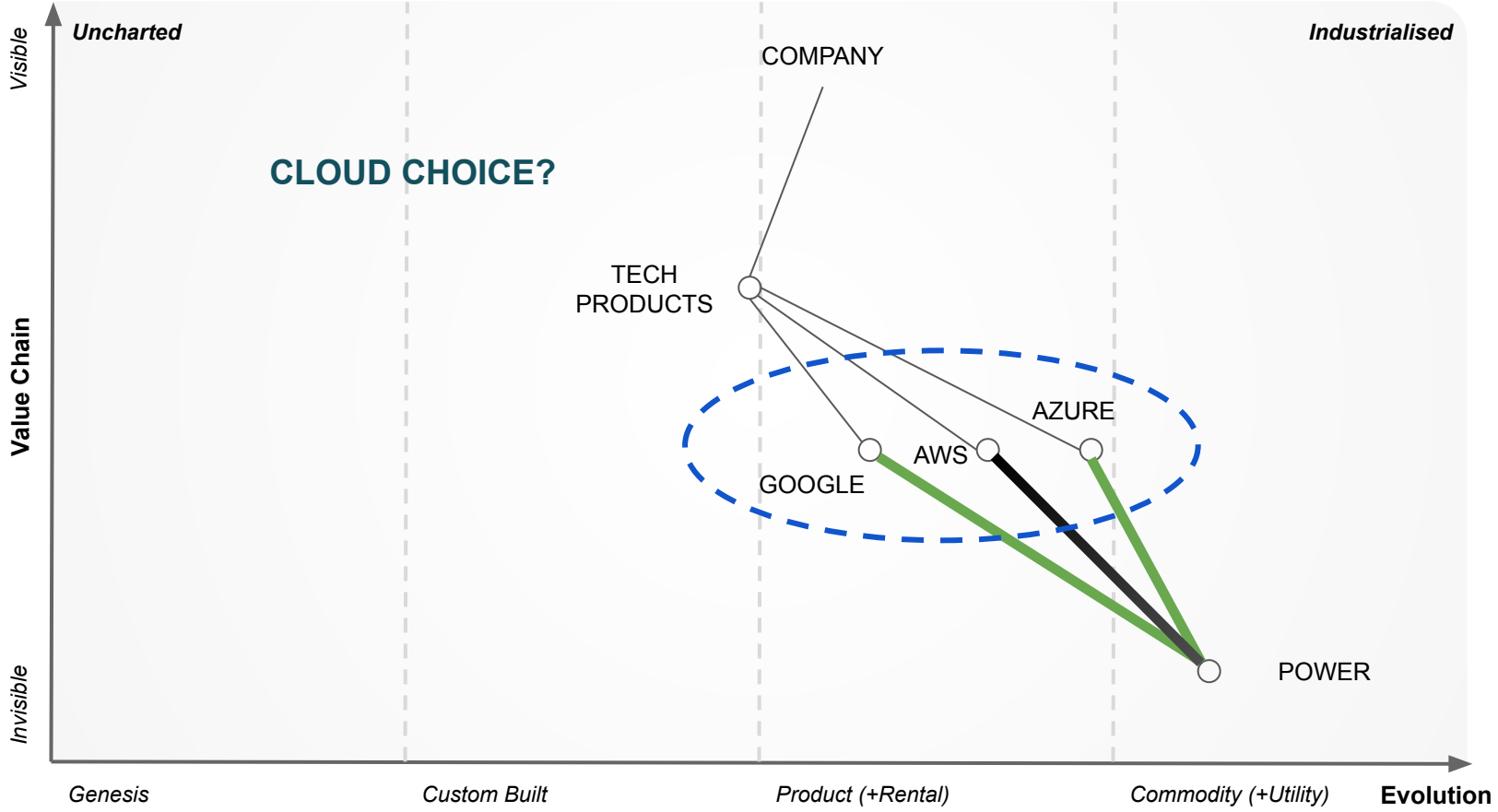
Change the landscape…?


Visible
Invisible
Value Chain
Uncharted
Industrialised
TAKE CONTROL OF ASPHALT SUPPLY
ROADS'R'US
PUBLIC
ROADS
+£290
ROAD BUILDING SUPPLIERS
+22
ASPHALT
Genesis
Custom Built
Product (+Rental)
Commodity (+Utility)
Evolution


Visible
Invisible
Value Chain
Uncharted
Industrialised
ROADS'R'US
PUBLIC
ROADS
SIMILAR ECONOMICS
LOWER EMISSIONS THAN ALL SUPPLIERS
+£290
+22
ROAD BUILDING SUPPLIERS
ASPHALT
Genesis
Custom Built
Product (+Rental)
Commodity (+Utility)
Evolution

What about choosing a cloud provider?

(if all compute was equal… which it isn't in cloud… see "serverless")


Visible
Uncharted
Industrialised
COMPANY
CLOUD CHOICE?
TECH
PRODUCTS
AZURE
AWS
GOOGLE
POWER
Value Chain
Invisible
Genesis
Custom Built
Product (+Rental)
Commodity (+Utility)
Evolution

Maps are useful for identifying and mitigating emissions

Downside: hard to report on your own and your supply chain emissions

(those numbers are not real!)

Maps may be useful for identifying other externalities too!

Ignoring the Climate Crisis isn't an option...

Link:
https://www.theguardian.com/environment/2019/oct/13/firms-ignoring-climate-crisis-bankrupt-mark-carney-bank-england-governor

Firms ignoring climate crisis will go bankrupt, says Mark Carney

Bank of England governor warns of financial collapse linked to climate emergency

- Top asset managers oversee $300bn fossil fuel investments
- Why are asset managers investing in fossil fuel companies?

▲ Mark Carney, the Bank of England governor, has led efforts to address the dangers global heating poses to the financial sector. Photograph: Leon Neal/Getty Images

Companies and industries that are not moving towards zero-carbon

Climate Change is changing our world:

The new normal

Mapping gives you tools to see the changing landscape and the externalities

Mapping can help us make better decisions around Climate Change