Big Data Technovation for Climate Change Mitigation through Forest Conservation and Restoration

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Outline

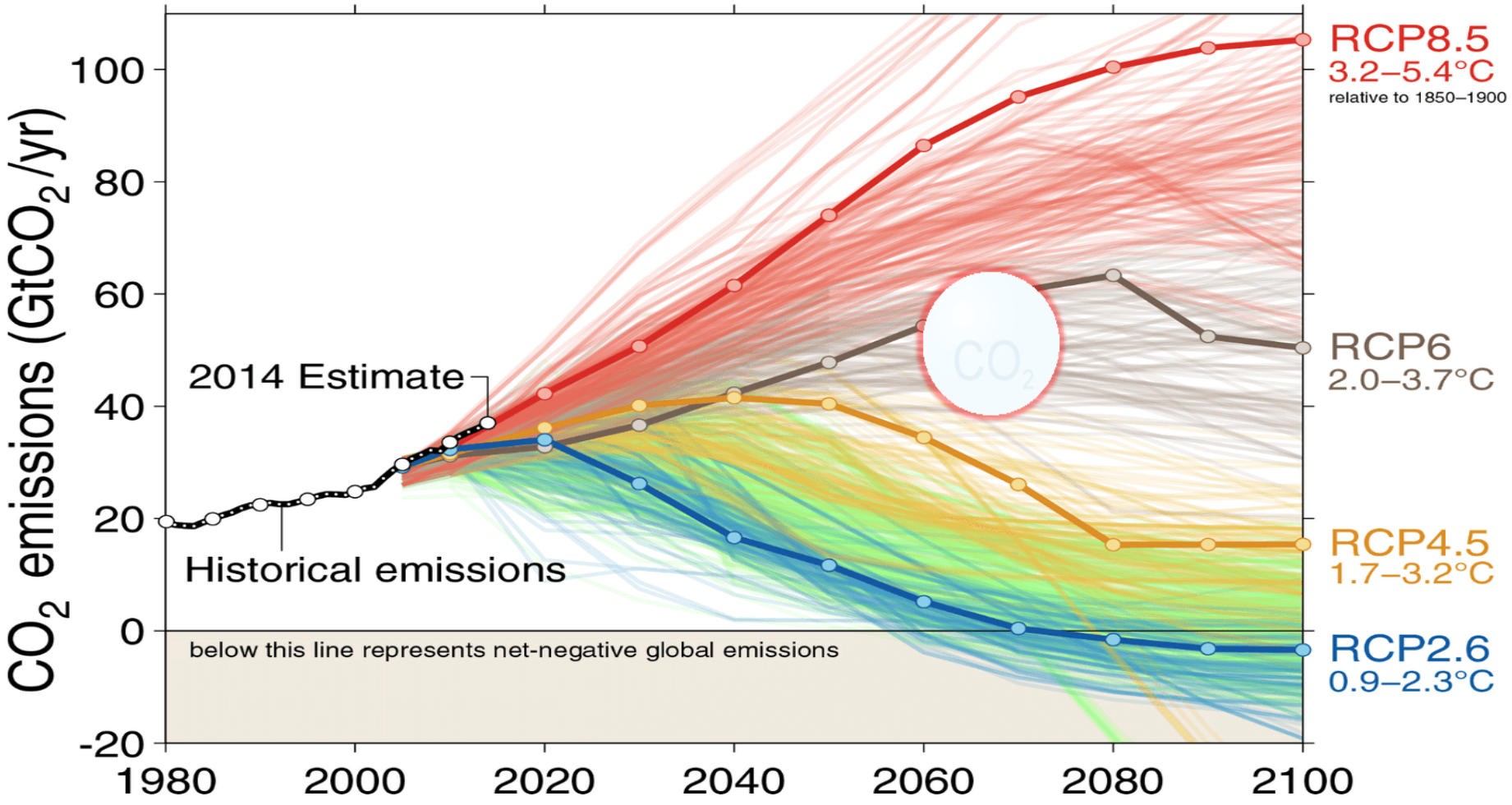
Part 1: Technovation and Forest Restoration and Conservation

- Climate Change and Paris Agreement
- Big data and Technovation
- Examples eco-technovation?
- Technovation for Forest Restoration and Conservation
- Biocarbon Engineering and Drone-Tree Planting
- Eco-technovation and Financing
- Concluding Remarks

Part 2: Pitch Deck and Evaluation

- Watch, learn and evaluate
- Using Google Forms

Rising CO2 and Climate Change

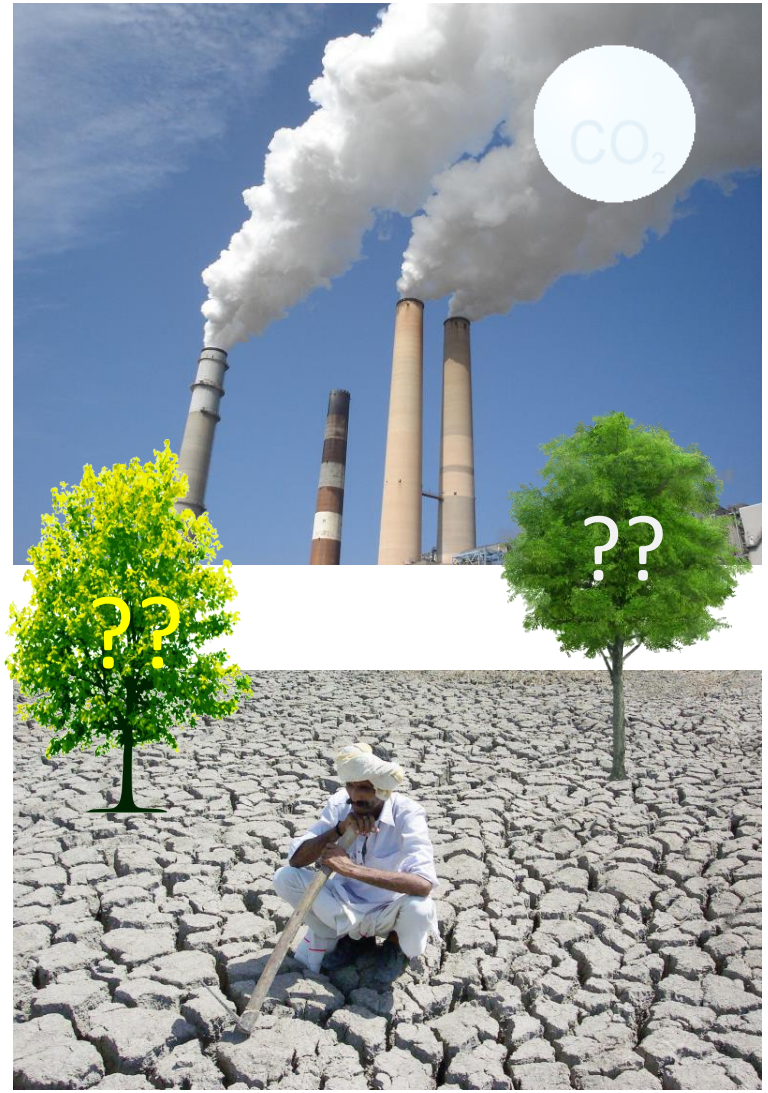


Global Carbon Emissions and Forestry

- We release a net **40 billion tons CO2** per year. Trees are the most efficient tool for removing carbon from the atmosphere, increasing and improving ecosystem productivity

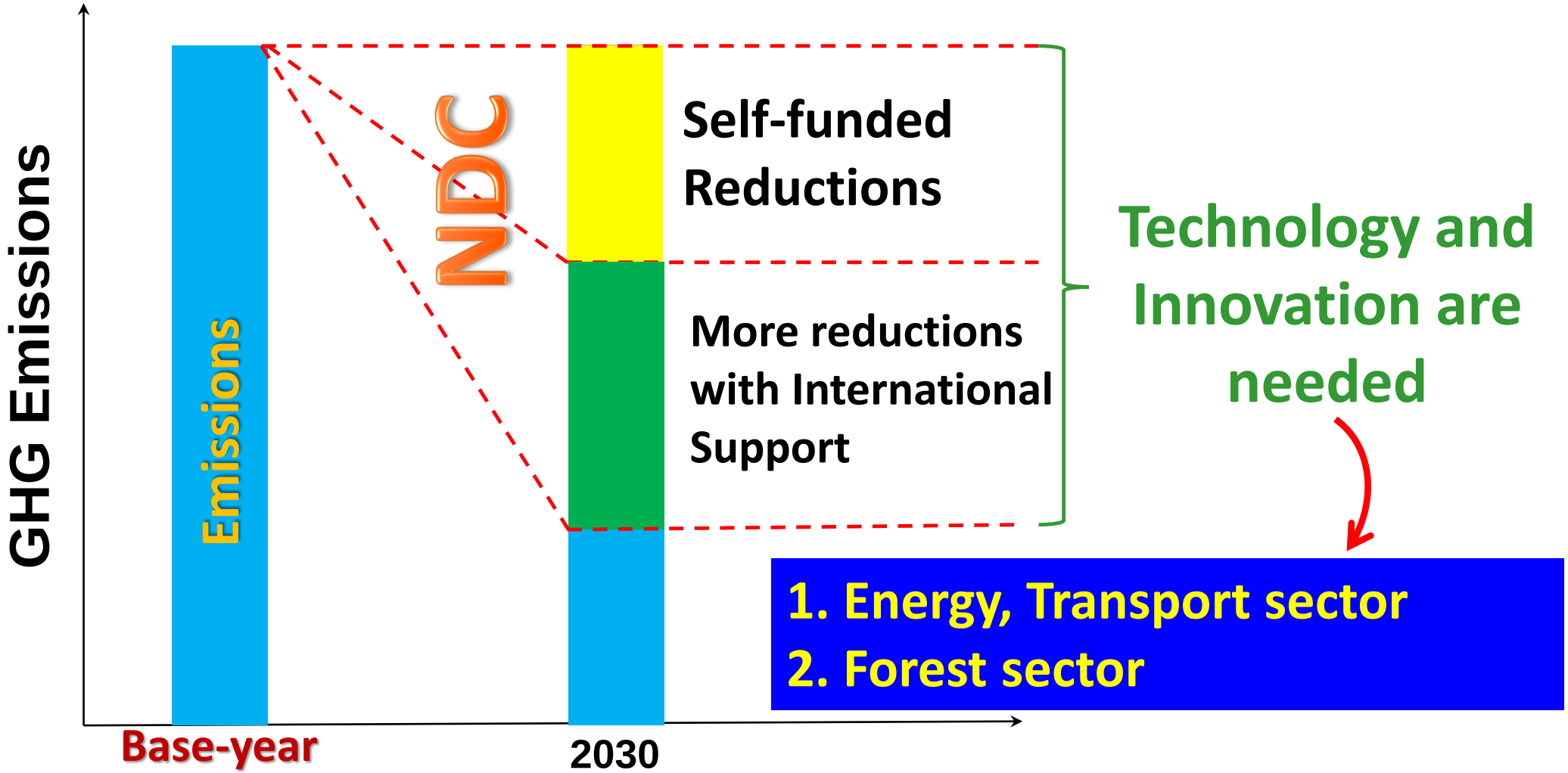
Problems

- **Food Shortage**: About 2 billion hectares of degraded lands globally and this degradation creates more food shortages.
- **Lack of Data**: Monitoring of the performance of forest restoration need transparent data but such data are lacking in tropical forests.



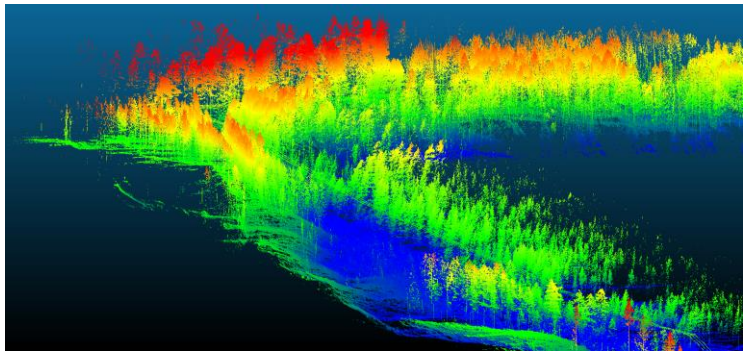
Paris Agreement and Mitigation

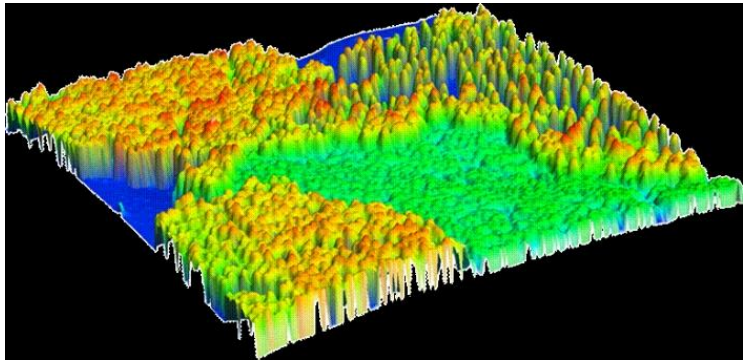
Paris Agreement (2015): Long-term commitment below 2°C
Goals: Climate Change Mitigation, Adaptation, and Sustainable Development
Parties: **N**ationally **D**etermined Contribution (**NDC**) = reduction commitment



Big Data and Technovation

- Big data is data sets that are so big and complex that traditional data-processing application software are inadequate to deal with them.
- *Example: If 40,000,000 Thai farmers upload one photo of her farming products every day, 140,000,000 MB/day are needed (photo size= 3.5 MB)*
- Innovation is viewed as the application of better solutions that meet new requirements, unarticulated needs, or existing market needs.
- Innovation takes place through the provision of more-effective technologies, products, processes, services, or business models that are made available to markets, governments and society.
- Technovation: Innovation that big data technology to solve the complex problems.





Data Storage, Transfer, Computation, and More

- Google Cloud
- Amazon Web Services (Cloud)
- Alibaba Cloud
- Other Could Services
- Example of data usage: Facebook
  - Value: $74 billion
  - Users: 1.4 daily active users
  - Photo uploads: 350 million/day
  - Data: 4 new petabytes/day. How many PC?

Google Cloud

amazon webservices™

Alibaba Cloud

Eco-Technovation and Examples

- Use of technology innovation for greening or environmentally friendly products
- Examples of Eco-technovation
  1. China: Meicai connecting farmers' products to local restaurants
  2. Japan: UMITRON reducing wastes in fish farming industries
  3. China: Ant Forest planting virtual trees on smart phones and reality

Example 1

Meicai and Sustainability

- APP connects Chinese farmers to nearby restaurants
- Business Model: B2B
- Raised Fund: US$477 million
- Innovation:
  - Deliver fresh food to restaurants in one day
  - Military Driver Position: Punctuality, Customer Reviews and Retention Rates
  - Stable wage for drivers: averaging 8,000 RMB (£850) a month
- Company valuation: $2.8 billion
- Users: Aim to reach 300 million users

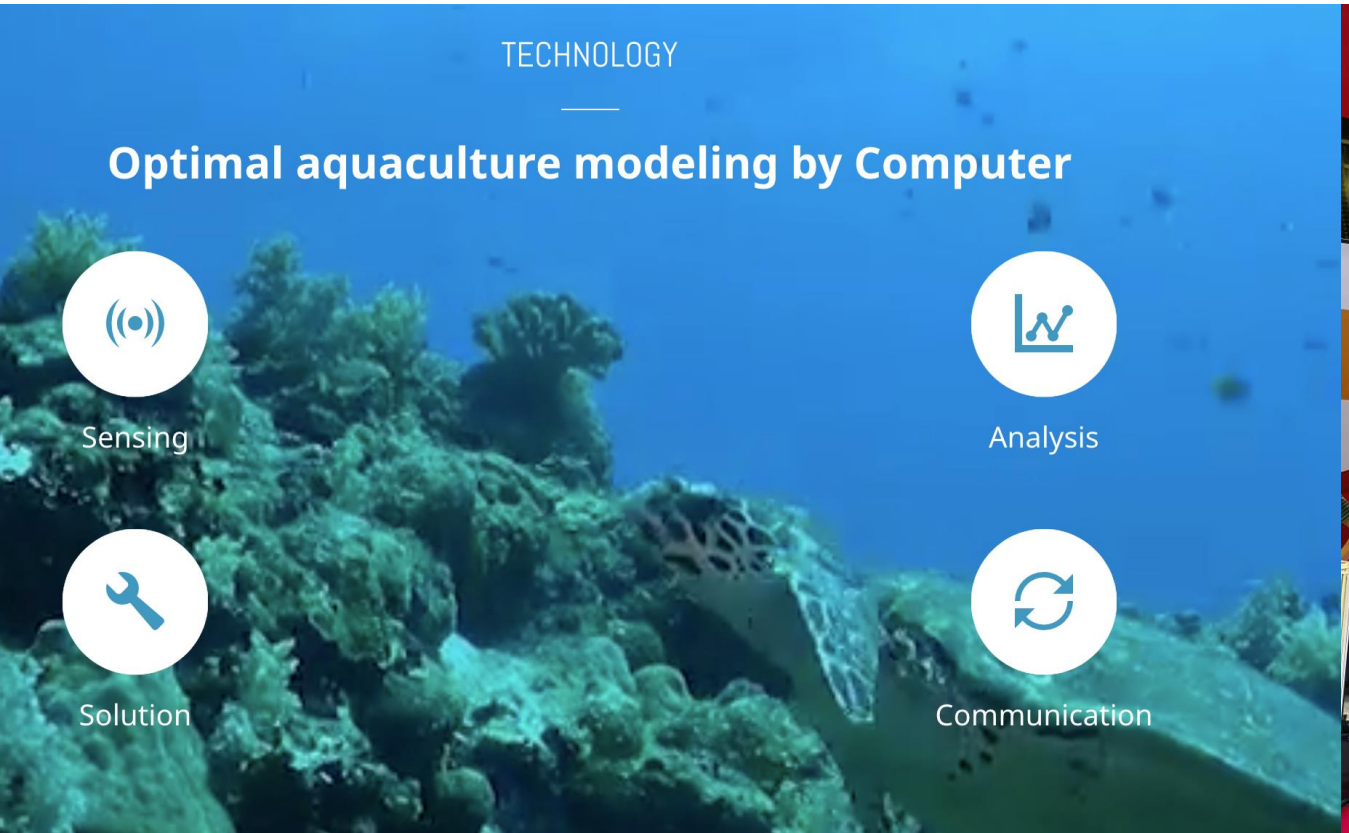
Example 2

IoT and AI for Fish Feeding: UMITRON.COM

UMITRON helps fish farms optimize their feeding practices through satellite imagery, AI, and data analytics to lower costs and prevent waste and damage to the environment.

Benefits: 70% cost saving and reduce wastes in the water

Established in 2016. Seed Funding (2018): US$8.4 million



Example 3

Ant Forest APP and Tree Planting

Launched: August 2016
Owner: Ant Financial Services Group
APP: Save Energy Points for Tree Planting
Activities: Walking, public transport, pay online, etc.
Current Users: 300 millions (Chinese only)
By 2017: 13 million trees planted, 800 hectares protected
By 2023: 500 million trees will be planted
Benefits to technovator: Save Environment, Company Branding and World recognition

Example 3

ANT FOREST AND WHY

Ant Forest is part of Alipay

By May 2017

- Over 40% of Ant Financial's 450 million users have signed up to app in just 9 months
- Behavior changes through app have avoided 150,000 tonnes of CO2 emissions
- Over 1 million trees planted as part of the scheme

Ant Forest, Tree Planting, and Users

Ant Forest Users visited the site (Photo: Pandaily)

Location for afforestation (Photo: Medium)

Technovation for Forest Restoration and Conservation

- Every year, 15 billion trees are destroyed from natural and anthropogenic causes. Although US$50 billion a year spent on replanting, there remains an annual net loss of 6 billion trees.
- Governments have made commitments to restore 350 million hectares of degraded land which could accommodate around 300 billion trees—by 2030.
- How these 300 billion trees are planted, managed and monitored? Need to have idea and commitment

Forest Restoration and Conservation

- In the tropics, we lost about 13 million hectare of forests over the last 30 years. Some have been restored
- World Leaders aim to restore 350 of forests by 2030
- One hectare of restored forest can store about **100-500 tonnes** of CO2 over a period of 20 years
- Emissions per capita: 40.5 tCO2 (Qatar), 7.6 (China), 4.5 (Thailand)

Technovation for Tree Planting: 14 Enterprises

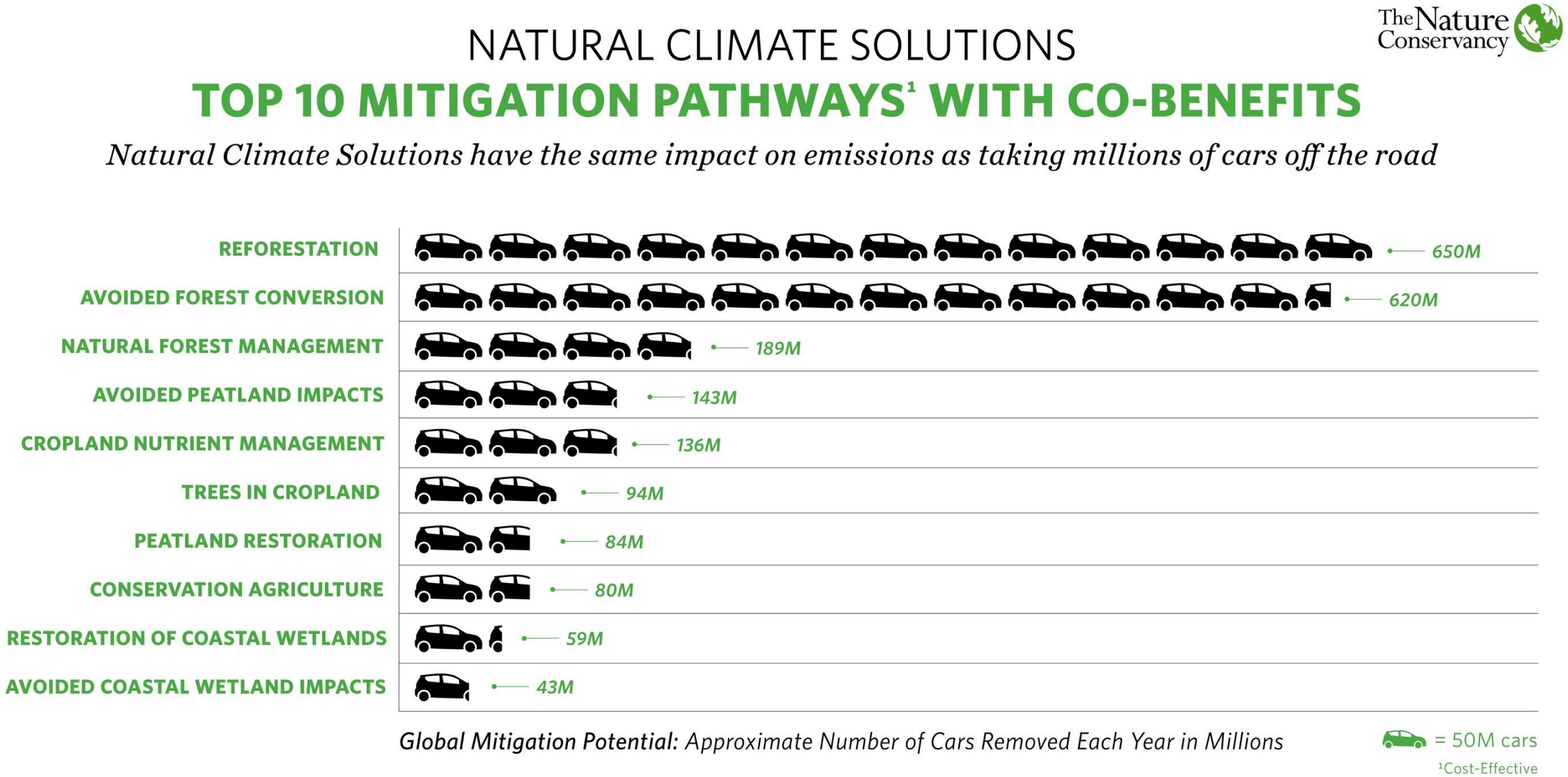
- BioCarbon Engineering
- Brinkman
- EcoPlanet Bamboo
- Ecosia
- F3 Life
- Fresh Coast Capital
- Guayaki
- Komaza
- Land Life Company
- Lyme Timber
- New Forests
- Symbiosis Investimentos
- Tentree, and
- Terviva

Land-Use Change Emissions in Miles Driven

2,000 Ha
of cleared rainforest

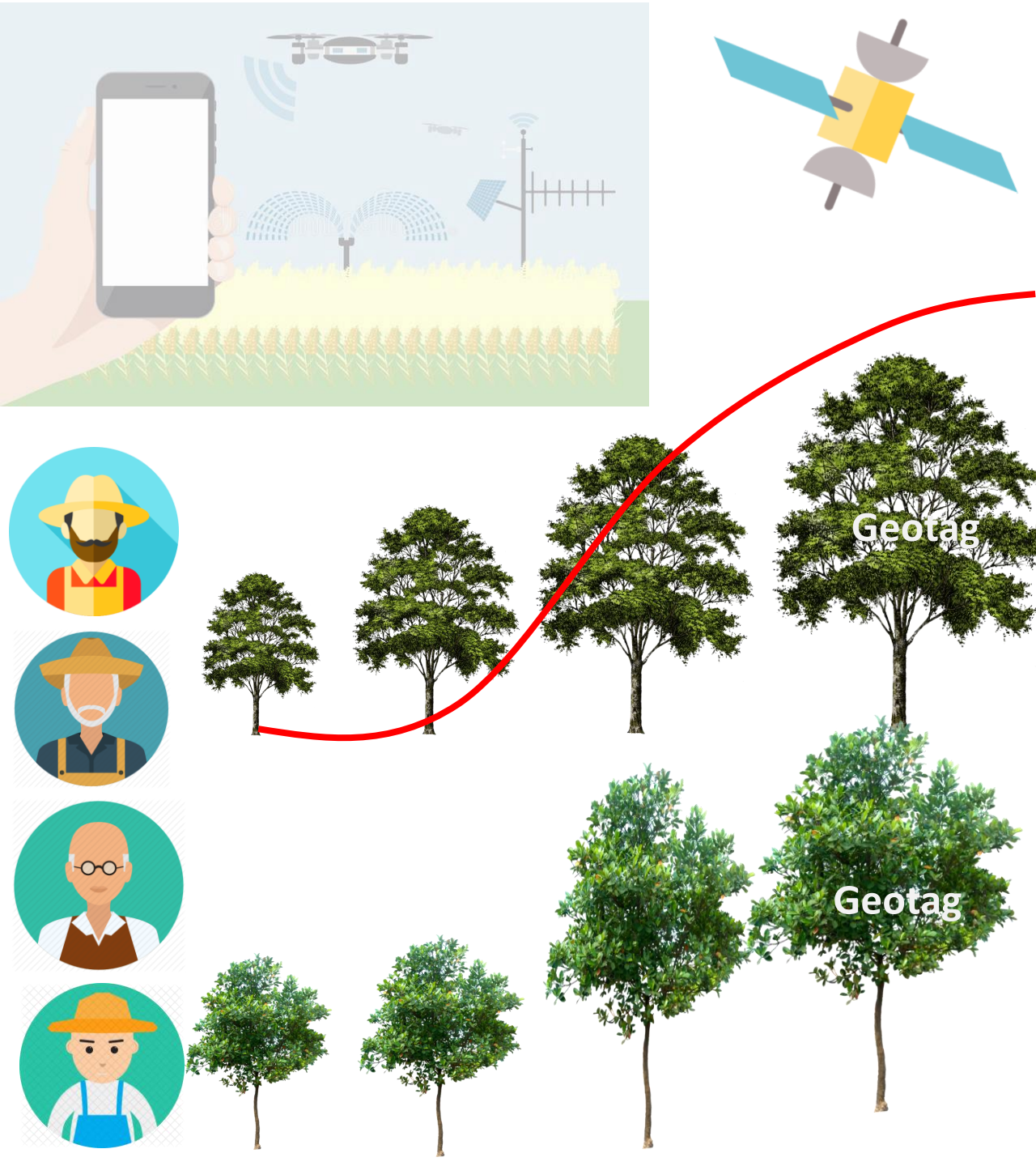
=

Why Forest Restoration and Forest Conservation?

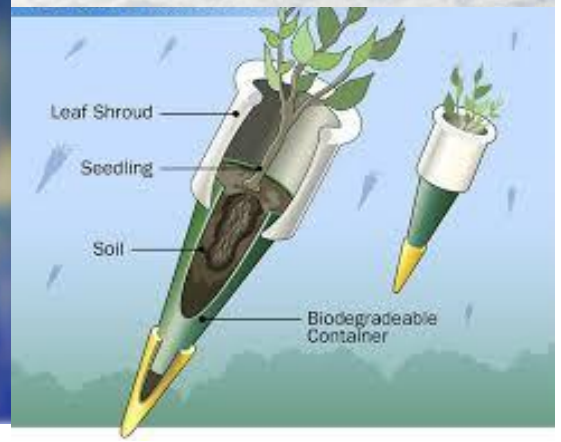


Why Big Data?

- Transparent measurement, reporting, and verification: Individual trees are geotagged and their growth and yield are tracked
- Trees and forests are owned by many stakeholders
- Tree growth and yields are affected by many factors
- Real-time or near real-time calculation give transparent results for carbon offsetters and farmers



Big Data Technovation: Drone for Tree Planting



BioCarbon Engineering

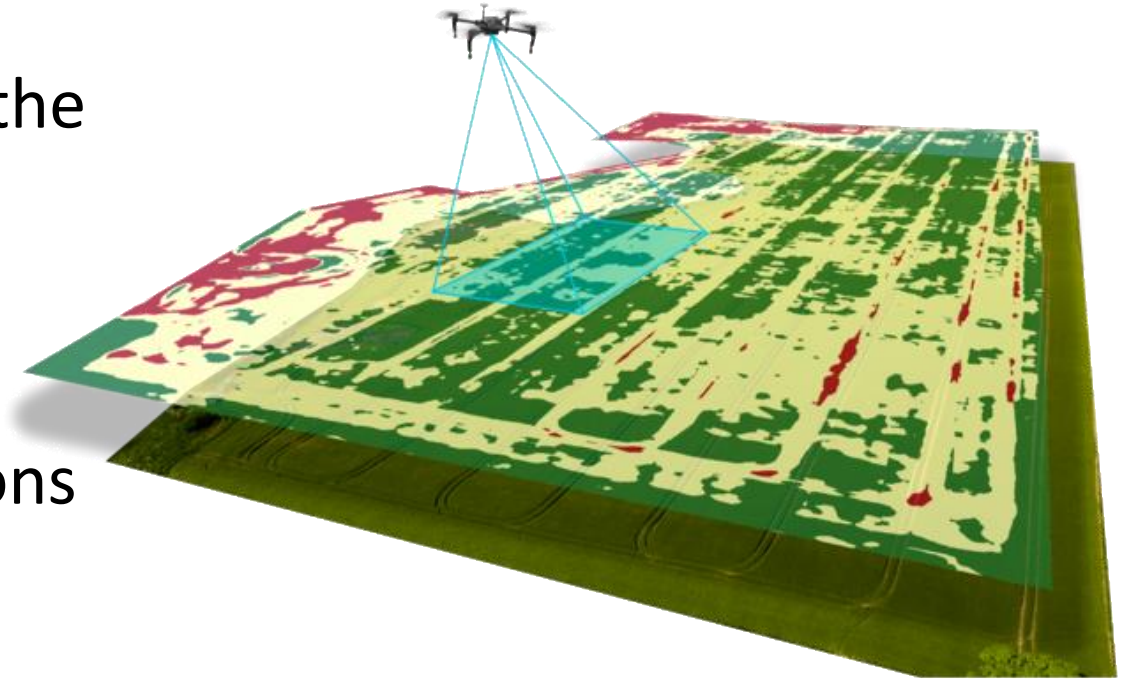
- Established in 2014
- Current funding: US$2.5 million (seed)
- Capacity: 100,000 trees in a single day
- Company aims to plant 1 billion trees using drones and air-fired planting systems
- Cost Savings: 15% of the cost of current methods.
- Two operators equipped with 10 drones can plant 400,000 trees per day.

The Business of Planting Trees

- BCE BioCarbon Engineering) is in full commercial operations with the first paid project in May 2017 in Australia.
- BCE has executed nine projects in the UK, Australia, Myanmar, New Zealand, South Africa, and Morocco
- Work in 2018 will expand to projects in the UAE, Canada, USA, Brazil, Peru, and Spain.
- Customers: Private landholders, companies, nongovernmental organisations, and governments.

Mapping

- The aim of the mapping phase is to gather as much information about the area of interest as possible. This includes data such as:
- Surface topology and slope angles
- Surface composition and obstructions
- Vegetative indices
- Soil type and moisture



Planting: Plant faster and more efficiently than ever

- The information gathered from the mapping phase is processed to create an optimised planting pattern over the area of the interest.
- The new trajectory will avoid the known obstructions, unplantable soil areas and existing trees.
- Analysis of the soil nature, moisture and density will help decide which seeds should be planted. Since it is generally advantageous to have a heterogeneous mix of tree species planted in the same area, the planting UAV is capable of carrying a mix of seeds and control their planting pattern.
- Planting frequency: < 6 seconds
- Multi-species carrying capacity: Yes
- Can plant in multiple soil types: Yes

Biodegradable Seedpods

- Fully biodegradable, designed to ensure high germination rates and customised to application.
- Degradation time matched to germination rate.
- Can carry multiple seed types and sizes.

Drone Monitoring

The UAV gathers similar data several times after planting and monitors the evolution of the site compared to the previous monitoring flight's information recorded.

Data collection

- Enhancing and expanding possibilities and knowledge
- The data from the monitoring and mapping phases is then crunched by BioCarbon's **Machine Learning algorithms**, which analyse the data before the next round of planting.

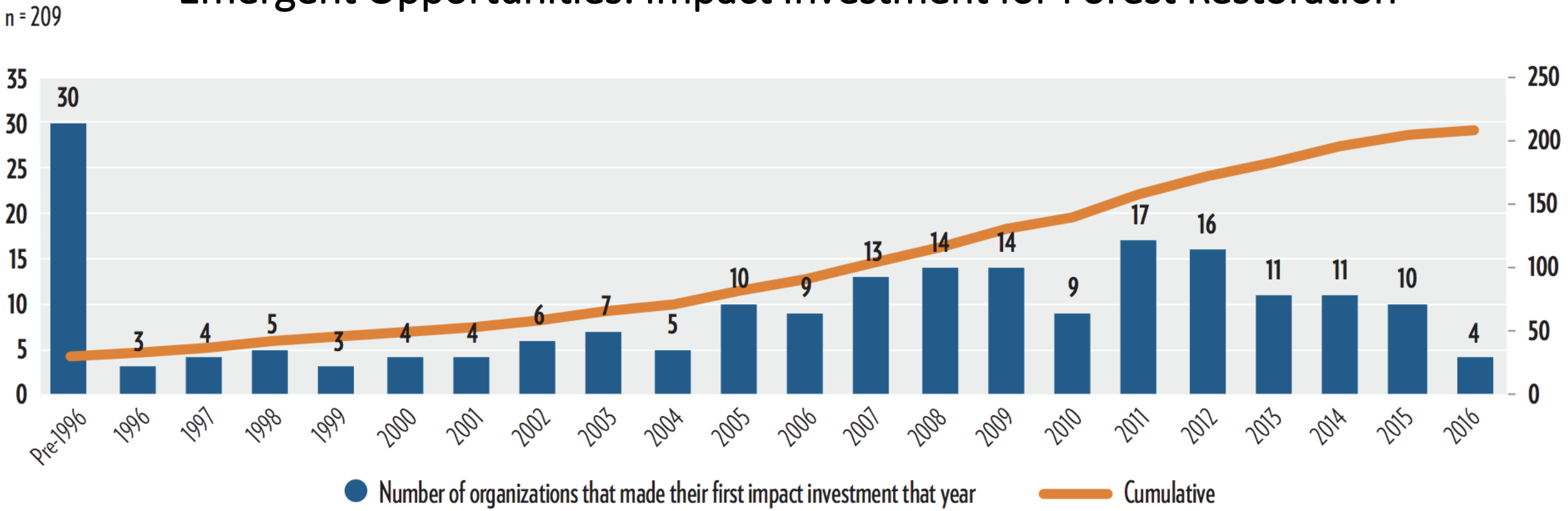
Watching Video: BioCarbon Engineering

https://www.biocarbonengineering.com/technologies

Possible Sources for Financing

- Conventional Sources: Investors
- New Sources: Impact Investors, Climate Financing

Emergent Opportunities: Impact Investment for Forest Restoration



Source: GIIN

208 respondents currently manage

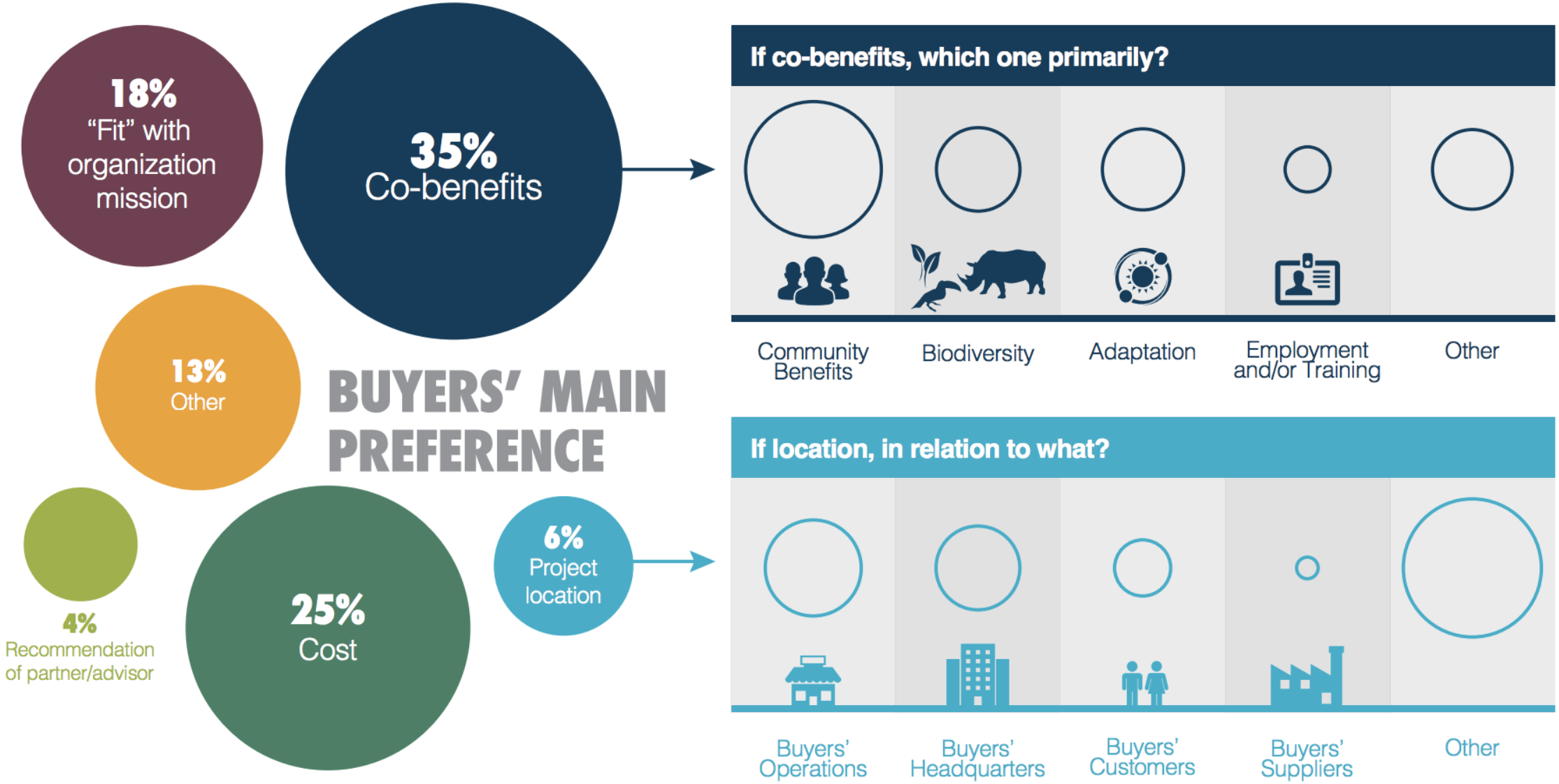
USD 114 billion

in impact investing assets*

It's a $250 billion market and it's growing fast

Ref: Climate Bonds Initiative

Reasons for Private Sector Involvement



Way Forwards

- Technovation is an important part for green economic development
- As data and technologies become increasingly available, innovative ideas how such data and technologies are needed
- With increasing interests and financial availability in technovation and sustainability, scalable technologies need to be developed
- Vision, Know-how, Idea and Commitment are what we needed

Thank You

Pitch Deck: Financing and Scaling-up

- Now You Have Big Dream, Got Idea and Products with the right team but no money. Stop it?
- There are many ways to get funding: own savings, relatives, friends, Angel Capital, Venture Capitals, Banks. But, do they believe you?
- Pitch Deck (Selling Your Product Idea): It is a brief presentation that provides investors with an overview of your business, whether it's showcasing your product, sharing your business model, giving a look into your monetization strategy, and introducing your team.
- Line of Your Venture: Incubator => Startup => Startup Accelerator => Company (Your dream!)

Watch Pitching Deck Structure

https://www.youtube.com/watch?v=S3n5YRZD4Cw

Follow-up By

Watch the Real Pitching and Evaluate. Are you Willing to Invest in any of these and why?

Watch and Evaluate 3 Pitches

Pitch One: Sustainability Tracker

https://www.youtube.com/watch?v=gDmaf1dCg94

Pitch Two: Lilium Aviation, On-demand urban air transportation with Zero Emission

https://www.youtube.com/watch?v=htaeARwse1w&t=48s

Pitch Three: CybelAngel, Online Security

https://www.youtube.com/watch?v=eL_SSM-xeMs&t=1s

Evaluate the Pitch

- Visit this URL: **http://bit.ly/2LlIHWD**
- Check the appropriate box

Stay in touch!

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