



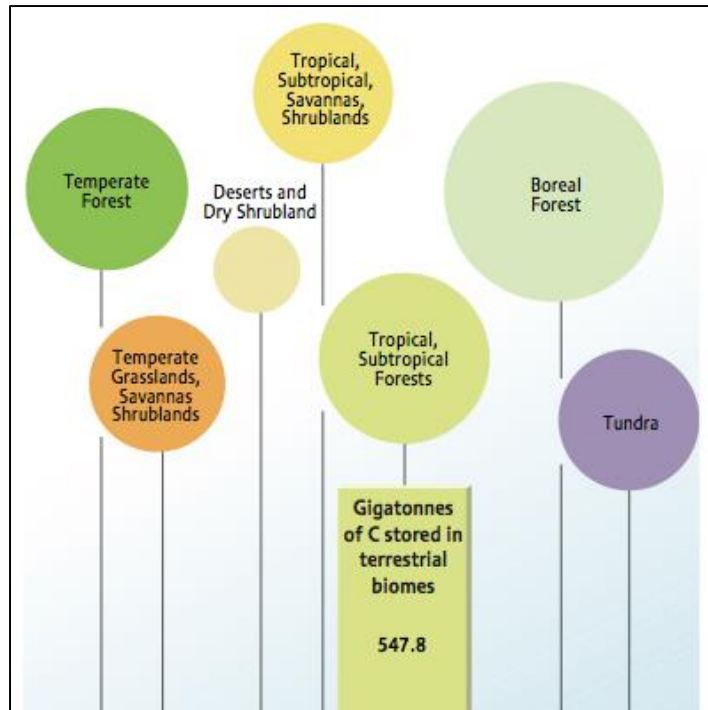
Status and Challenges of Mangroves in Carbon Markets

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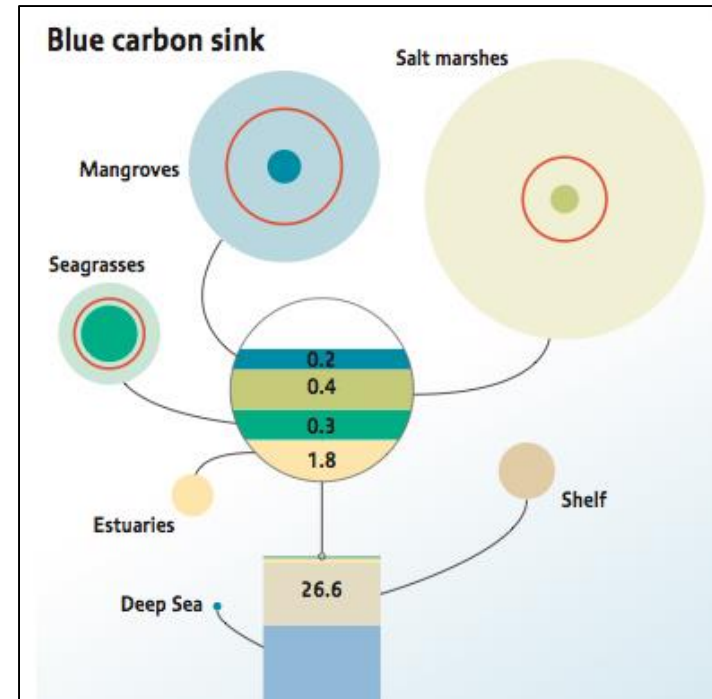
President & CEO

Green & Blue Carbon Sinks

Green Carbon: the carbon stored in terrestrial forests, grasslands and tundra



Blue Carbon: the carbon stored in mangroves, seagrasses and coastal marshes – as well as cypress tupelo swamps



from Nellemann et al. (2009)

Emissions Trading

- **Voluntary Markets**
 - Corporate Social Responsibility
 - VCS, ACR, CAR
 - \$3.30 tonne
- **Compliance Markets**
 - California, Quebec, Ontario 2017
 - Linking to Acre, Brazil?
 - < \$12.70/ tonne
 - UNFCCC
- **Internal Corporate Pricing**
 - \$18/tonne
- **Success Needed in Voluntary Market**



Carbon Offset = 1mtCO₂e

We still have Paris!

- Countries push to commit beyond 2° C
 - 100 countries collectively aim for 1.5° C
 - 128 subnational jurisdictions also commit
- Sustainable Development Goals referenced
 - Protecting the environment
- Inclusion of results-based payments REDD+
- Private sector more present than ever!
- 1000 companies call for a price on carbon
 - Set “Science-Based Targets”
 - Seek to “inset” their supply chain

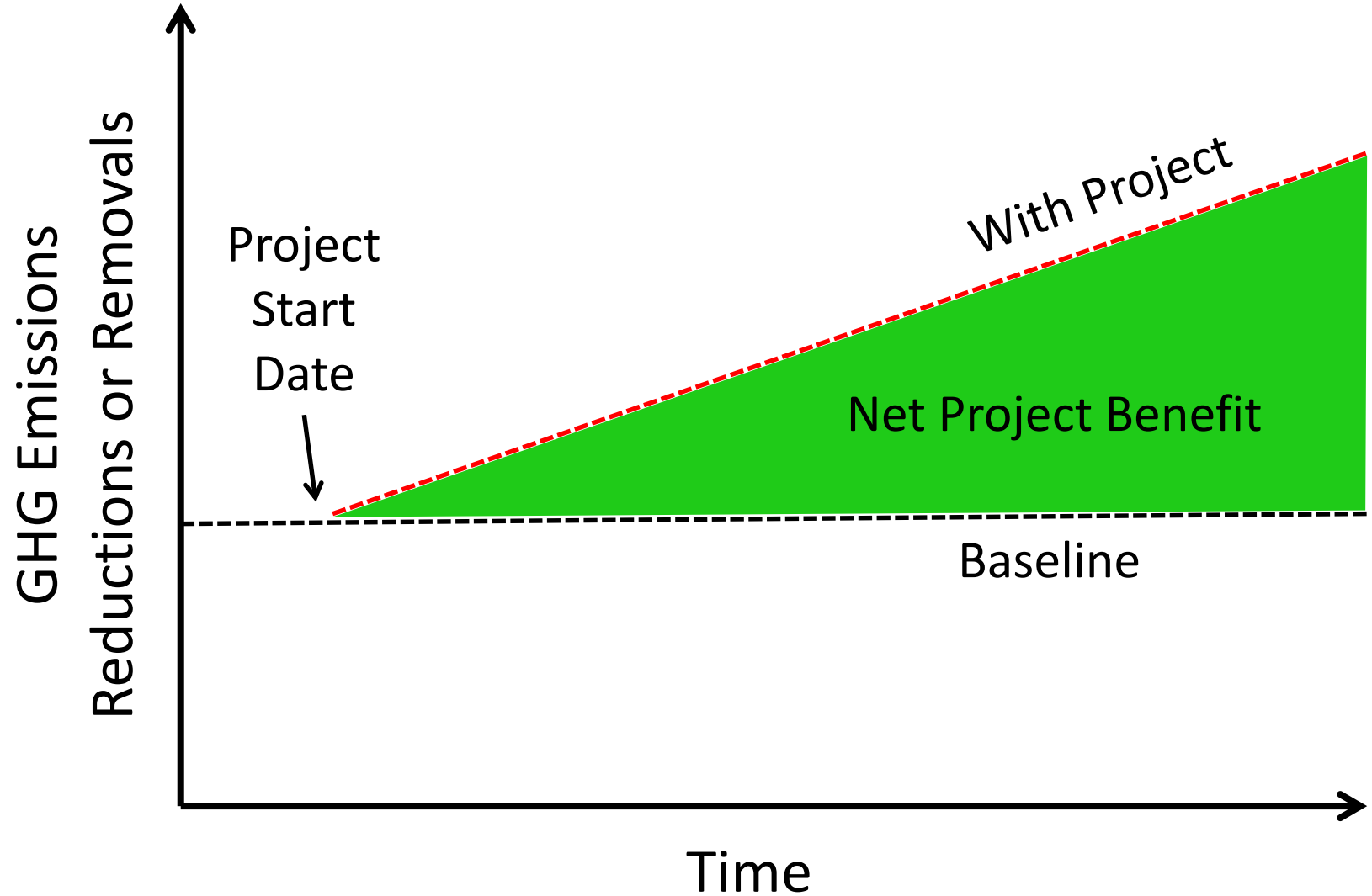


Protocols and Methodologies

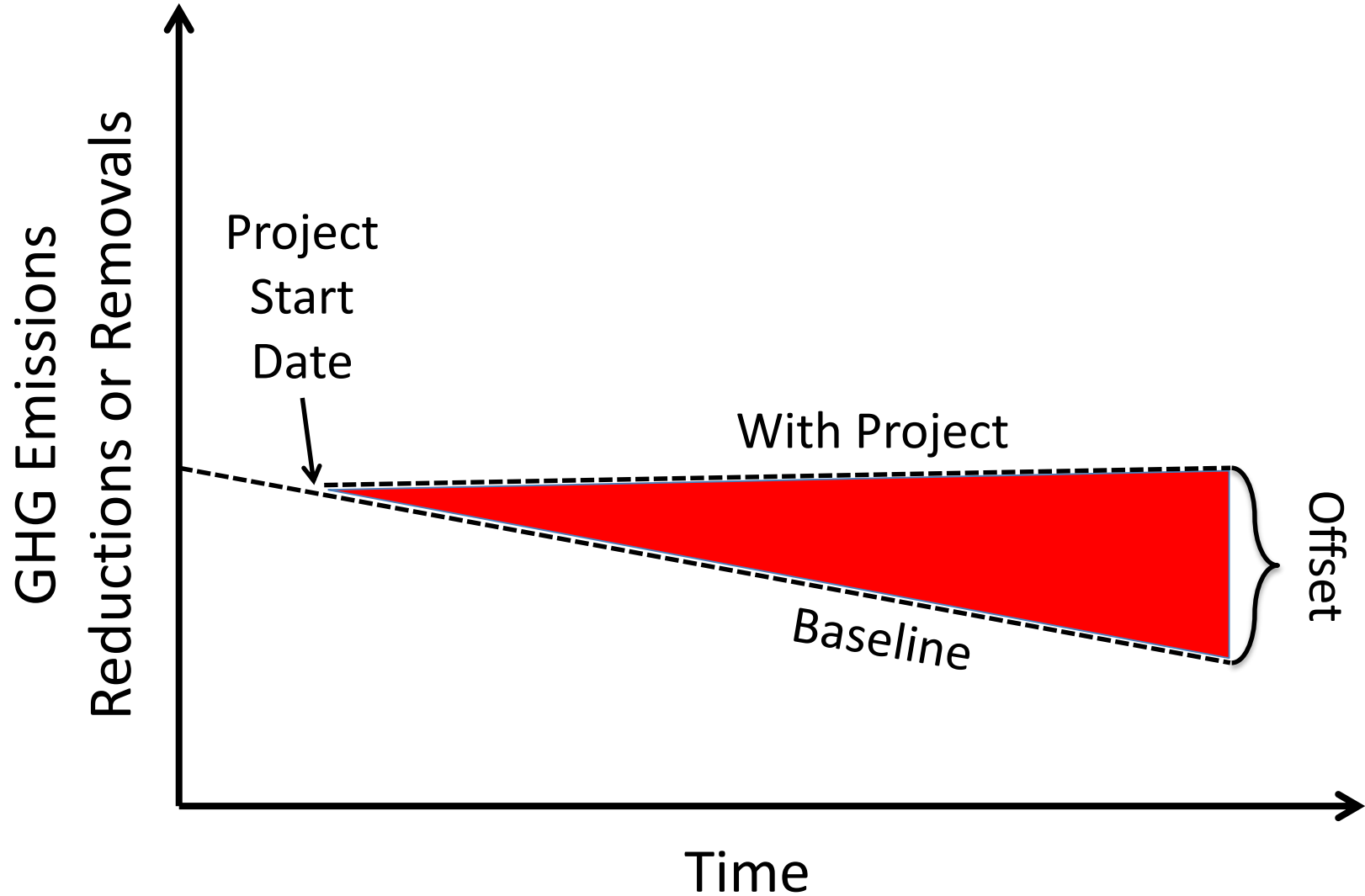
- Standardized and transparent market practices
- Rigorous scientific framework for project development
 - Eligibility rules
 - Quantification and monitoring of eligible carbon pools
 - Baseline, project, and emission reduction equations
- Foundation for third-party validation and verification
- Guarantee accounting and quality of the carbon offset



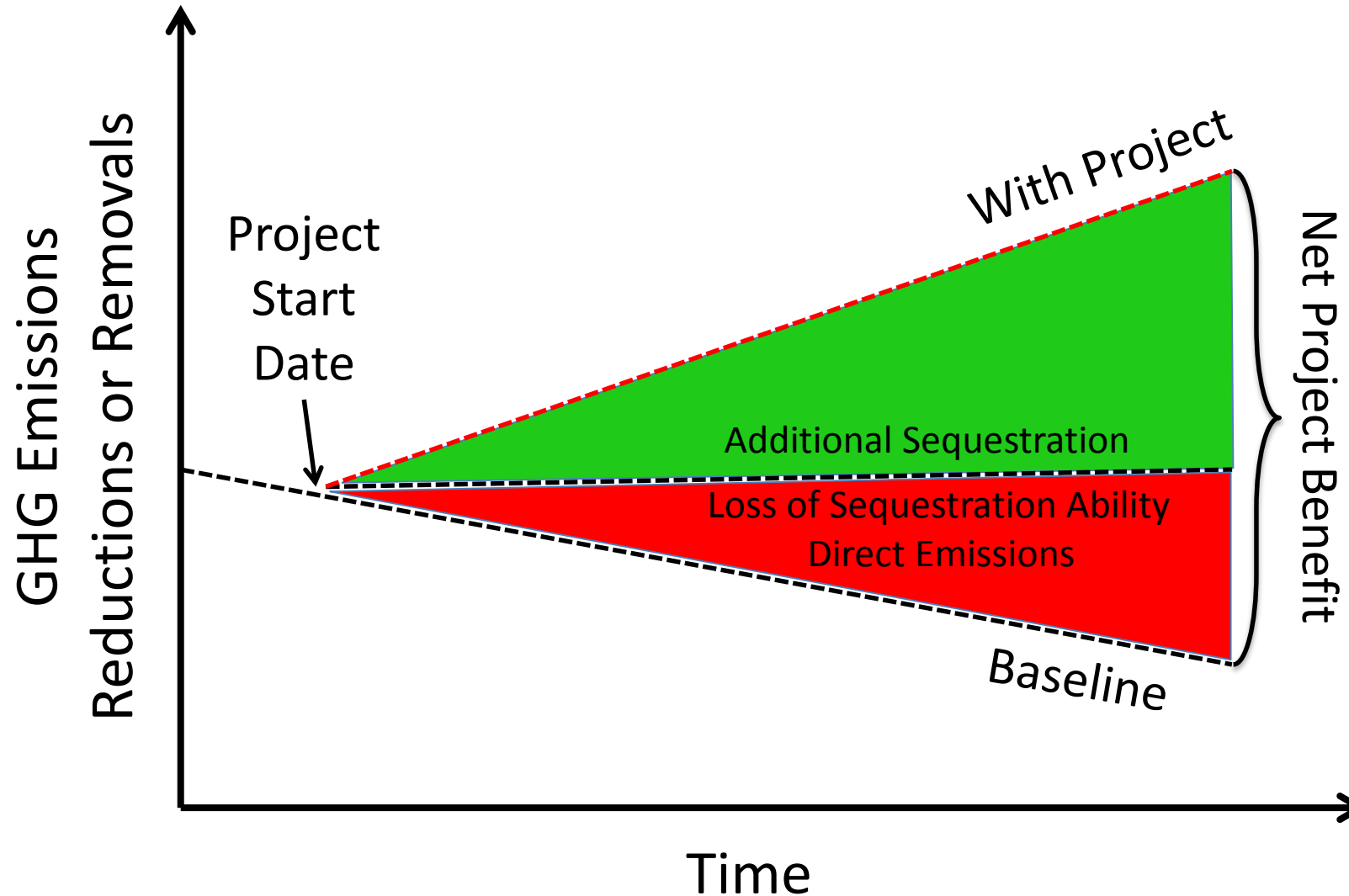
Afforestation, Reforestation, and Revegetation (ARR) (Mangrove Planting Project)



Reduced Emissions Deforestation and Degradation (REDD) = Mangrove Forest Conservation



REDD+ = Preservation & Enhancement of Carbon Stock (Mangrove Conservation + Planting Program)

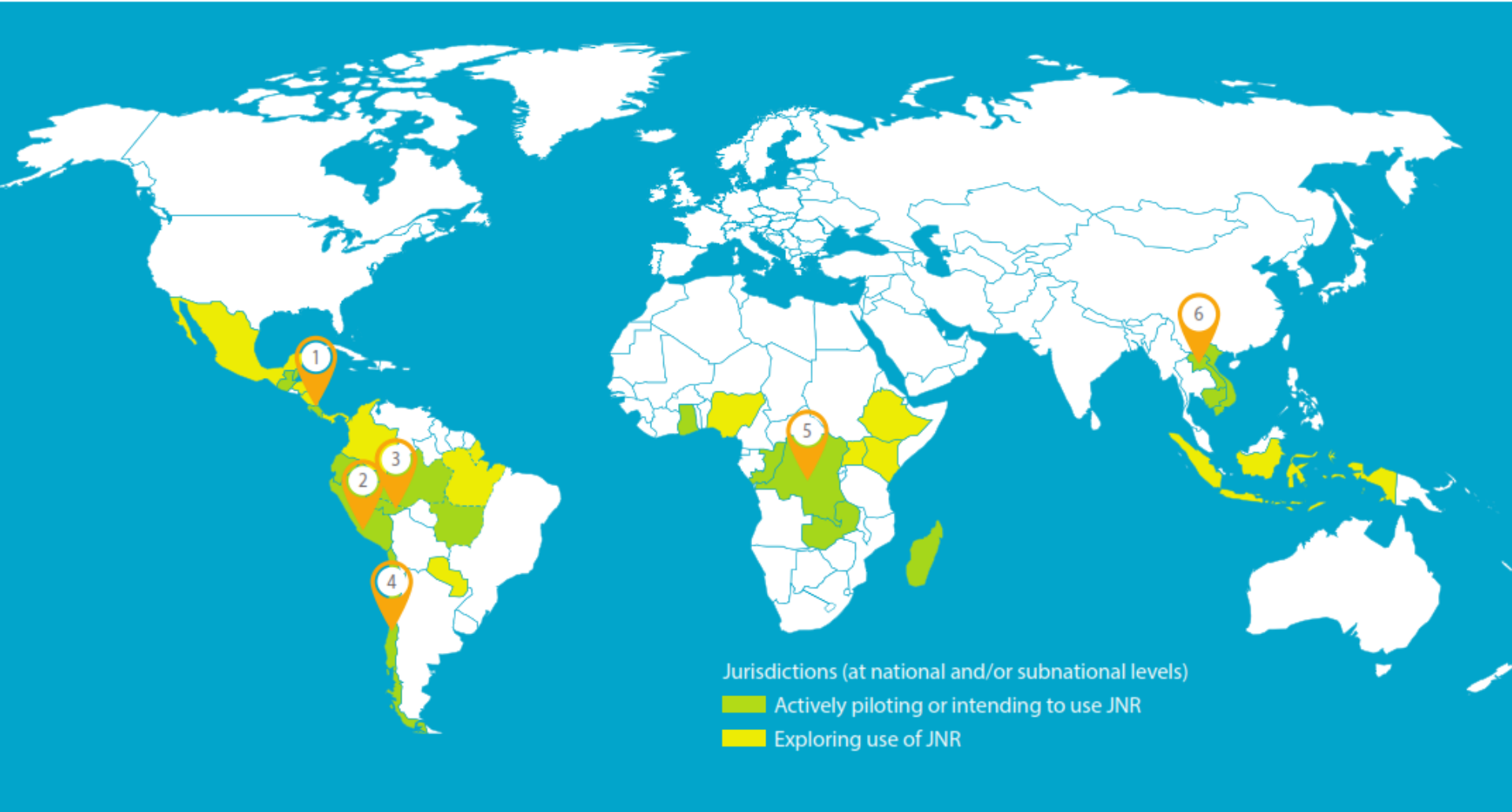


REDD+?

- Deforestation and degradation contributing 10-15% of global emissions
- REDD+ currently produce project-level initiatives
- Push for larger initiatives at State and Country level to meet climate goals
- VCS is developing guidance document for project, jurisdictional, and national scales
- 300+ companies commit to reduce deforestation through their supply chain.

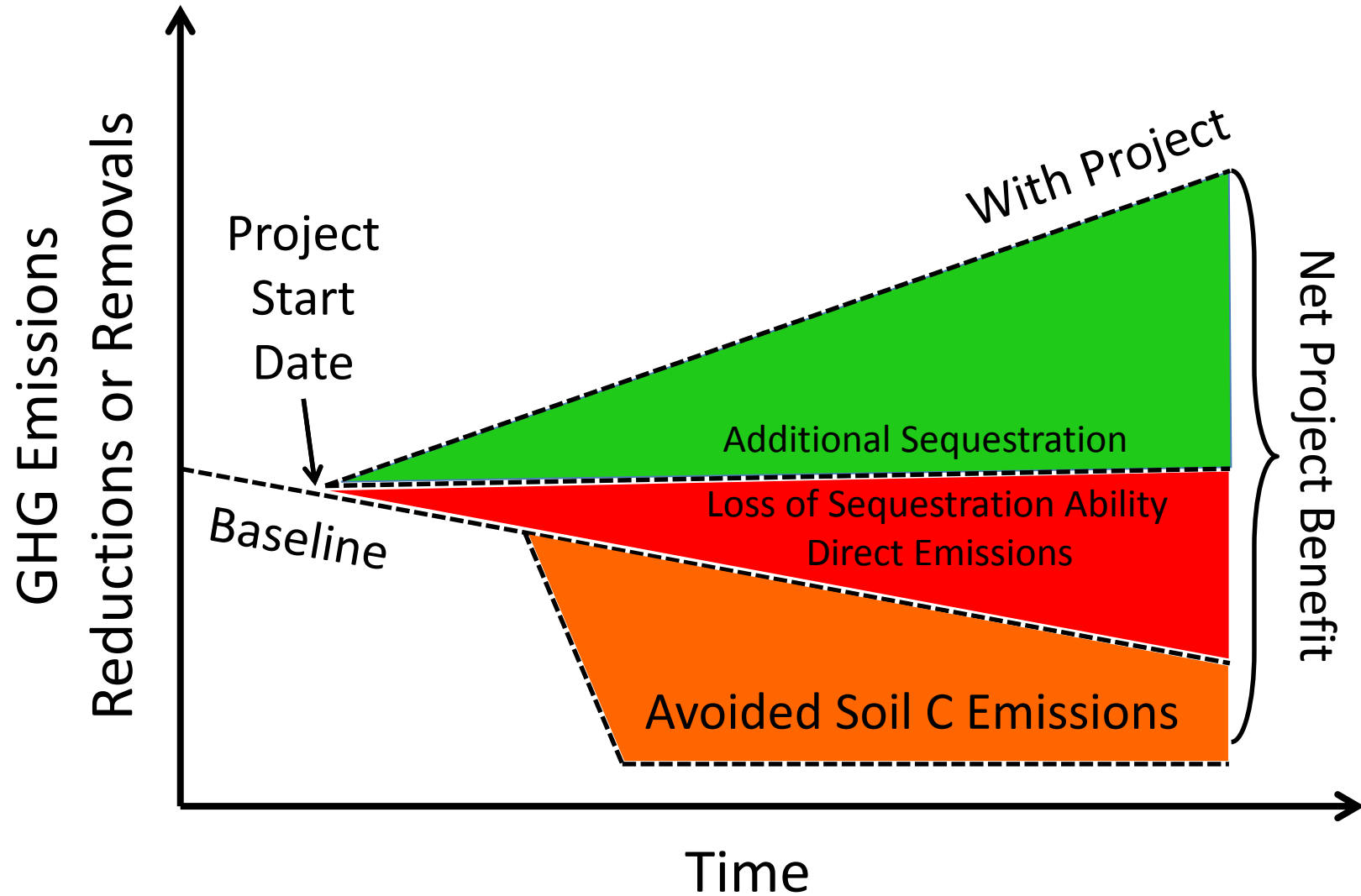


Jurisdictional and Nested REDD+



Jurisdictions Adopting the VCS JNR Framework

Optimizing Offset Yields



Existing Projects

- **Kenya** – Mikoko Project – Plan Vivo- Plan Vivo Standard
 - Mangrove reforestation planting 4000 trees annually 117 ha
 - Above ground carbon
 - **Credits – Plan Vivo and transacted**
- **India** – Sundarbans – Livelihoods / NEWS –UNFCCC Standard
 - Mangrove reforestation planting 16 million mangroves 6,000 ha
 - Above and below soil carbon sequestration
 - Credits – Quantified through -VCS ARR mangroves- used for insetting
- **Indonesia** – Livelihoods/ Yagasu – VCS Standard
 - Mangrove reforestation 5,000 ha
 - Potential of 456,896 ha
 - Threat of land conversion and illegal logging of mangroves
 - VCS Afforestation, Reforestation, Revegetation (ARR) methodology
- **Senegal** – Livelihoods/Oceanium – UNFCCC Standard
 - Mangrove reforestation planting 10,000 ha
 - Restore rice paddies



Challenges

- **Supportive science**
 - Emissions during mangrove loss
 - Variations in soil depth and soil type
 - Fate and transport of soil C
 - Land-use change on soil C
 - Quantitative estimates of estuarine/delta and oceanic/fringe
 - Variation in emissions
 - Accurate spatial data
- **Well fitting methodologies**
 - Optimize carbon offset yields
 - Soil pool, above and below ground seq, loss of stocks, loss of seq
 - Allowing modified hydrology and addressing potential GHG's
- **Simplify monitoring, reporting, and verification**
 - GHG emission factors and other references
 - Reduce project development costs
- **Carbon market dynamics**
 - Realistic timelines
 - Low carbon prices and low demand
 - Positive global climate discussions
- **Practicalities**
 - Providing income within ~ 3 yrs
 - Working with government and other partners

Final Conclusions

- Growing recognition of wetlands' role in climate change mitigation and adaptation.
- Current ARR and REDD+ projects in voluntary markets.
- Target areas:
 - Jurisdictional REDD+ programs in Latin America, Africa, and Asia.
 - Brazil and SIDS
- Seeking partners on mangrove projects that demonstrate climate adaptation benefits:
 - Mangrove restoration projects,
 - Mangrove conservation projects with a demonstrated pressure for conversion.

Questions?



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