



**NATURE BANK**

**Carbon Markets Overview**  
**State of Hawaii Offset Symposium**  
**April 10, 2019**



**NatureBank Asset Management Inc.** has been involved in carbon markets since 2005.

We provide carbon offset project origination, development and commercialization services for voluntary and compliance carbon markets.

We offer advisory services for corporate GHG management, sustainable agroforestry and land use management.

We have developed projects all over the world, working with private and public companies, land owners, governments, NGO's, Native American Tribes, First Nations and Indigenous communities.

# What are Carbon Markets?

“Carbon Markets” exist where there is trading of carbon emission allowances and/or offsets, which incentivizes companies or countries to limit their GHG emissions through the lowest cost option while driving investment and innovation.

There are both “Voluntary” and “Regulated/Compliance” carbon markets worldwide.

*Carbon Markets exist in 45 jurisdictions and 25 subnationals around the world with a reported market value of \$82 Billion in 2018 (World Bank 2018 report)*

# Compliance and Voluntary Markets

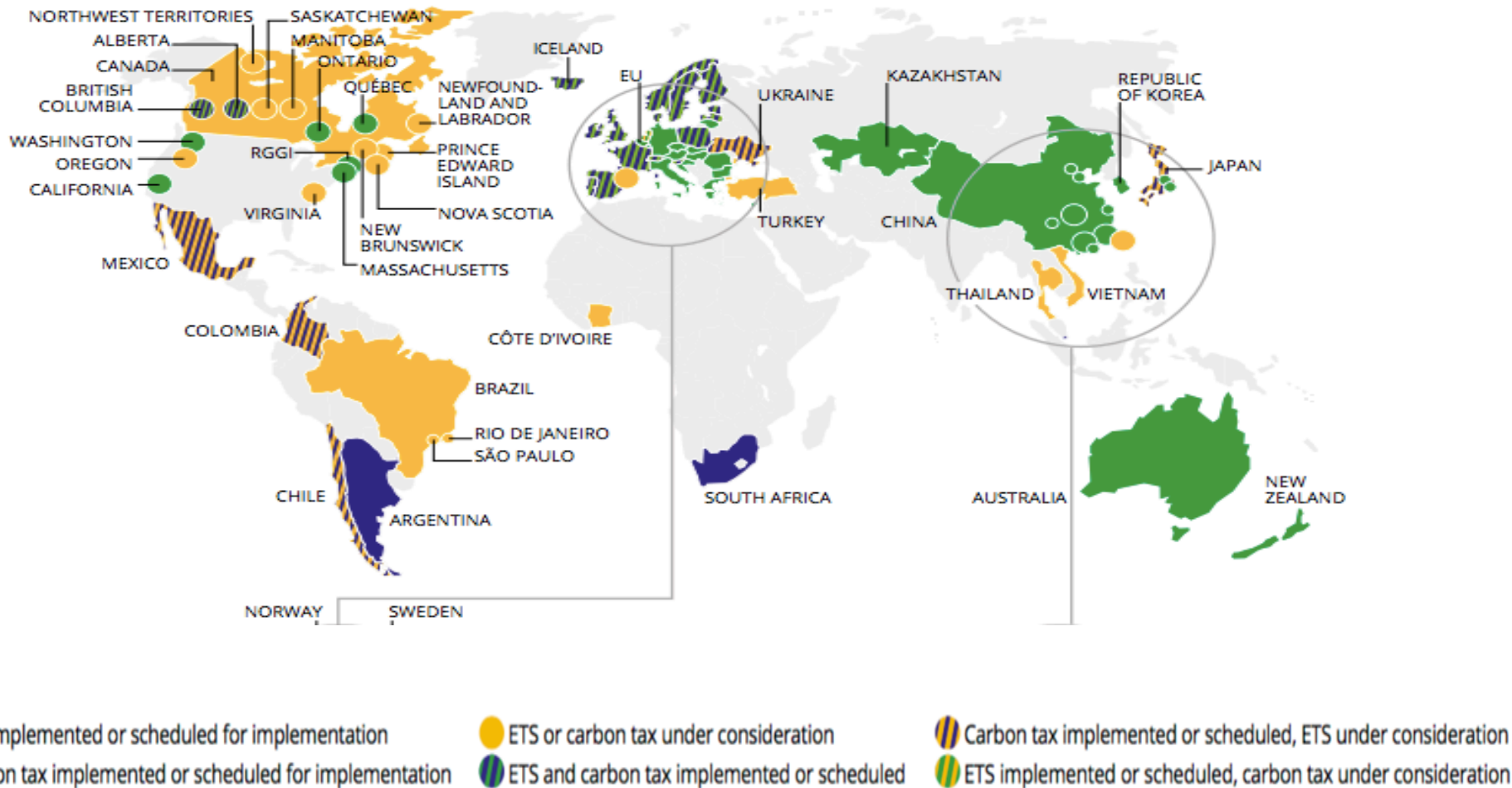
**Compliance Markets** – government regulated programs that institute a price on emissions based on mandated reduction targets through a market based approach (cap-and-trade) or a carbon tax.

**Voluntary Markets** – offset based market where organizations purchase and trade offset projects to meet voluntary commitments.

*Voluntary markets co-exist with compliance markets and offer more flexibility but lower market size/price and demand.*

# Where do Carbon Markets Exist

**Figure 1 / Summary map of regional, national and subnational carbon pricing initiatives implemented, scheduled for implementation and under consideration (ETS and carbon tax)**



# North American Carbon Markets

- **California** - (“AB32” – Global Warming Solutions Act)
- **RGGI** - Regional Greenhouse Gas Initiative
- **Quebec** - (Linked to California under cap and trade program - WCI)
- **British Columbia** - (“GGIRCA” – Greenhouse Gas Industrial Reporting and Control Act)
- **Alberta** – (“CCIR” Carbon Competiveness Incentive Regulation)
- **Canadian Federal Program** – (Pan Canadian Framework on Clean Growth and Climate Change)

- *Lack of federal action is driving US states to address climate change and implement carbon pricing/market solutions at the state level.*
- *Currently 10 states with Cap-and-Trade programs*
- *Oregon poised to be next and first state to link to California*

# Allowance vs. Offset

*Within compliance carbon markets there exist allowances/permits and offsets*

**Allowance** – government issued permit based on a specific allocation of emissions that are distributed for free or auctioned to regulated entities under a cap-and-trade program.

**Offsets** – represent an actual GHG reduction that is purchased at a lower cost to allowances as a means of managing GHG compliance obligation.

# Role of Offsets in Carbon Markets

***An offset represents the reduction, removal or avoidance of greenhouse gas emissions, measured in metric ton of CO<sub>2</sub> equivalent (MTCO<sub>2</sub>)***

- Offsets serve as a key component to carbon markets but represent only a small % of the overall market
- In a compliance market, offsets provide a lower cost solution to regulated entities for their compliance liability
- Discounted value applied against allowances/permits due to invalidation risk profile
- Heavily impacted by supply and demand, policy changes
- Actual GHG reduction outside cap sectors
- Provide Non-program revenue



# Offset Value Add to Market

- Achieve real emission reductions
- Lower cost and efficient option for managing GHG reduction programs
- Promote innovation and technology transfer
- Alleviate compliance costs
- Provide co-benefits – (environmental, socioeconomic, SDG)
- Enable linkage and trading between entities and other jurisdictions
- Alternative revenue streams and access to private capital

# Types of Offset Markets

## Compliance

- Government regulated programs where offsets are legally eligible for a % of compliance obligation
- Examples: Western Climate Initiative, EU ETS

## Pre-Compliance

- Early action participation based on carbon pricing policy speculation
- Examples: CORSIA, WCI

## Corporate Voluntary

- Non-regulated programs driven by corporate mandates to reduce specific scopes of GHG emissions.
- Examples: Carbon neutrality, internal carbon pricing, GHG reporting

## Retail

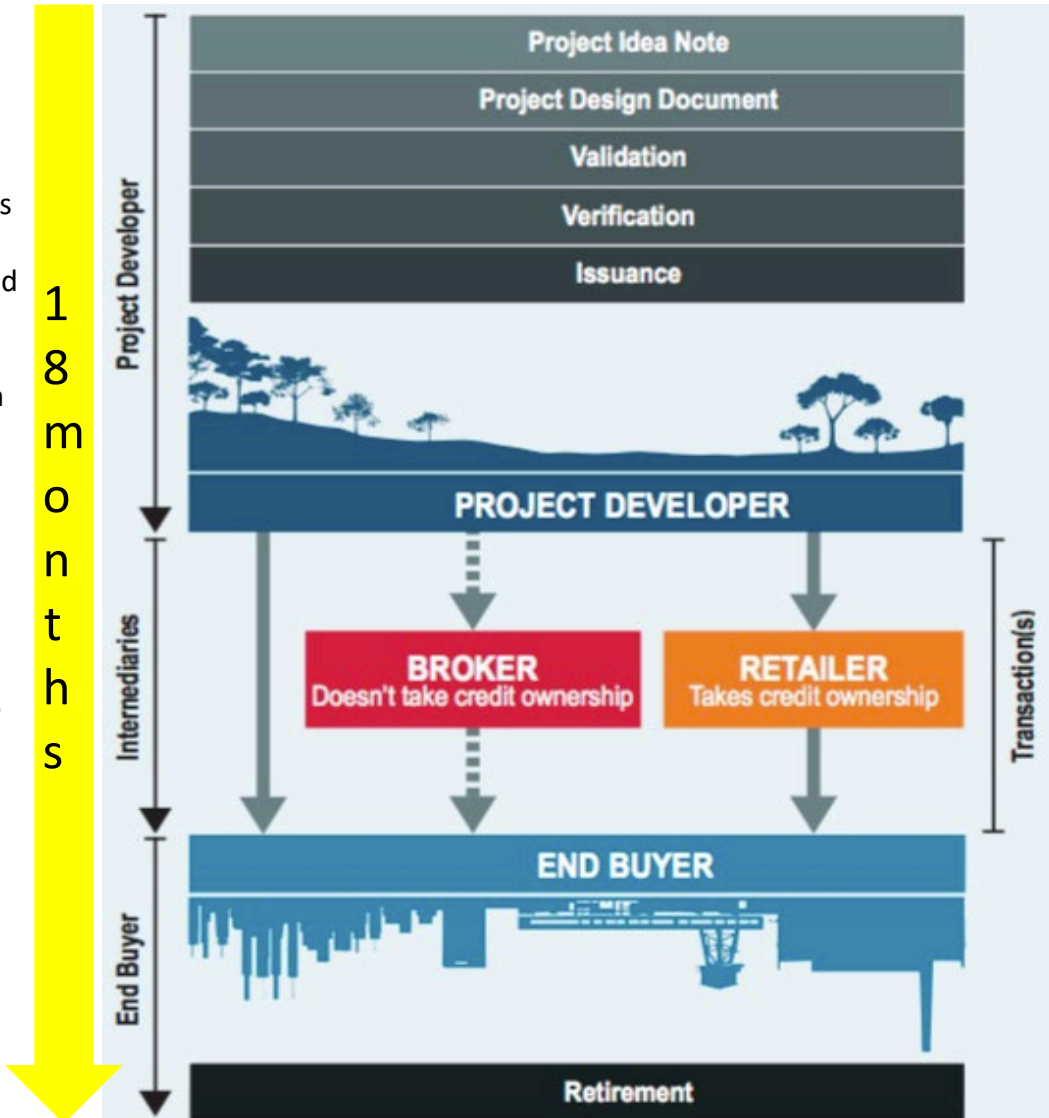
- Small companies, individuals
- Examples: Travel, weddings, consumer purchases

# Offset Market Participants

Project Developers contract with project owners and manage the development and commercialization process

Most large transactions avoid intermediaries due to added cost and role of developer

End buyer often engages early in the process for due diligence and price negotiations.



Third party services and agreements often applied in development process

Legal contracting - offset purchase agreements with owner intermediary and/or end buyer  
Compliance contracts require KYC

Registry manages issuance and retirement of offset volume

# Carbon Market Drivers



# Buyer Profiles

## Compliance

- Oil and Gas - BP, Shell, Chevron
- Utilities
- IPPs
- EITs
- Trading firms
- Aviation (pre-compliance)

## Government Funds/Foundations

- World Bank Fund
- Norway
- Corporate Foundations
- REDD+ funds

## Corporate Voluntary

- Airlines
- ACA – 237 airports
- Fortune 500
- Disney, Walmart, Google, Microsoft, DOW, GM, Barclays, Allianz, Lyft, BP Target Neutral

## Retail/Consumer

- Travel
- Lifestyle
- Consumer purchases
- Carbonfund, Offsetters, Terrapass

# Pricing

***Offset prices vary widely based on market type, policy risk, project type, standard and vintage.***

## Common pricing assumptions

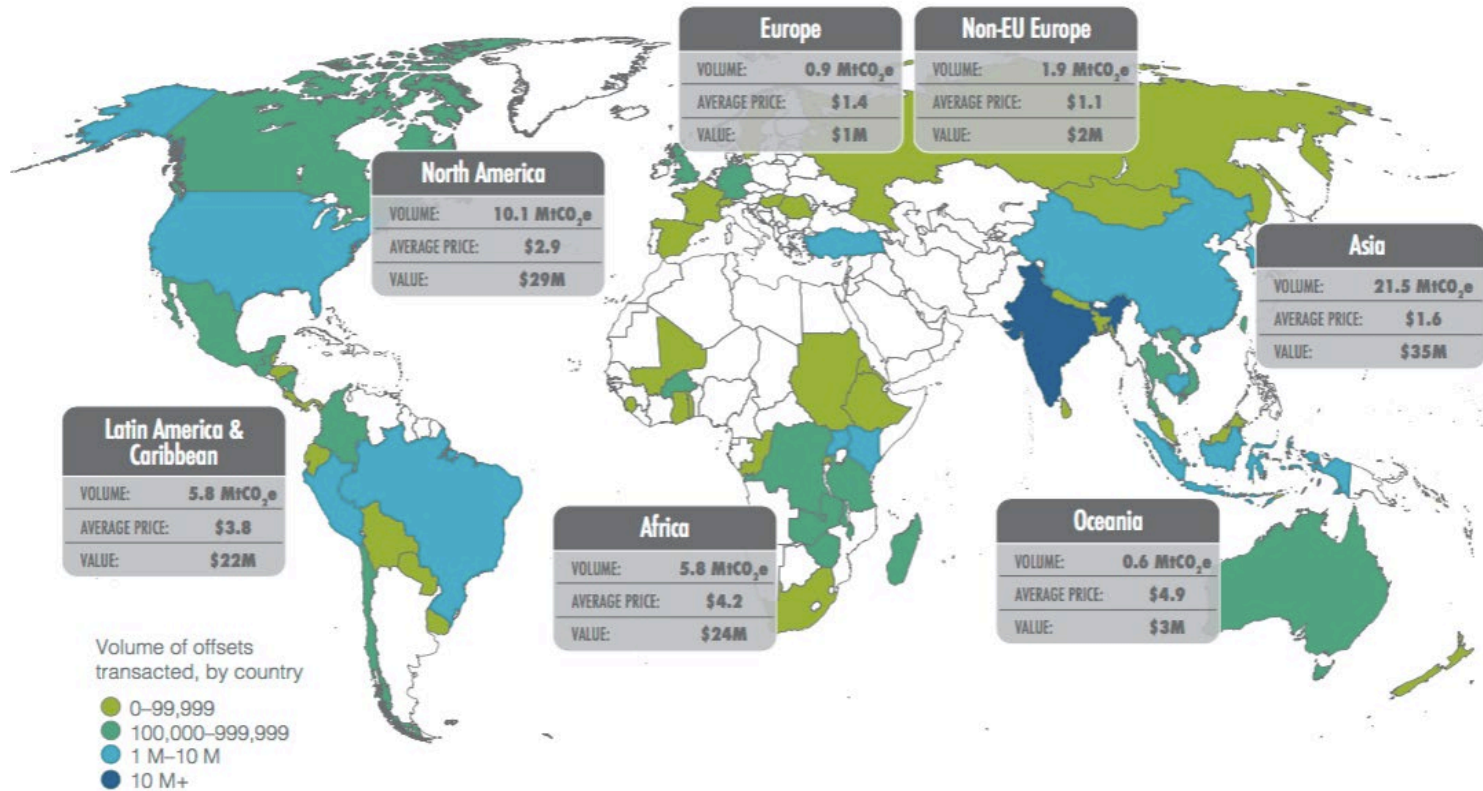
- Pricing is based on per ton basis, i.e. \$/ton of MTCO<sub>2</sub>
- Typical volume thresholds for buyers based on market
- Large volume transaction often priced in tranches
- Compliance pricing is often indexed and discounted to allowances prices
- Ability to pre-purchase/finance with discount to market
- Supply and Demand driven
- Co-benefits can carry added market value
- Fixed costs and variable costs

# Sample Offset Pricing

Market	Product	Standard	Price
California (WCI)	CCO	CARB	\$12 - \$13.63
Alberta		Alberta	\$24
EUETS	CER	CDM	\$.25
Voluntary	VER	VCS	\$.50 - \$12 Average \$3
Voluntary	REDD+	VCS CCBA	\$3 - \$7
Voluntary	VER	Gold Standard	\$3 - \$15

# Global Voluntary Market Value

Figure 8: Market Size by Project Region and Country, 2016



Notes: Based on 769 transactions representing 46.5 MtCO<sub>2</sub>e in 2016.



# California Cap-and-Trade Program

- The “Global Warming Solutions Act – Assembly Bill 32” began operating in Jan 1, 2013, linked with Quebec 2014.
- Reduce GHG emissions to 1990 levels by 2020, and then 40% below 1990 levels by 2030
- Program extended to 2030
- Economy wide, Covers 350 businesses, 600 facilities, full Cap-and-Trade system that includes allowance allocations, allowance auctions, banking, trading and offsets.
- **Offsets are eligible up to a maximum of 8% of the compliance obligation until 2020 and then 4% from 2020 rising to 6% in 2025**
- The California Air Resource Board (CARB) adopted and adapted offset protocols from the Climate Action Reserve (CAR) for use under the regulated system.

# California Offset Market

***Currently the largest offset market***

**Allocation:** 8% compliance obligation until 2020 changing 4% from 2020 rising to 6% in 2025. 2% in state requirement

**Protocols:** California Air Resources Board (CARB)

**Project types:** Forestry, Ozone Depleting Substances (ODS), Livestock, Mine Methane Capture, Rice Cultivation

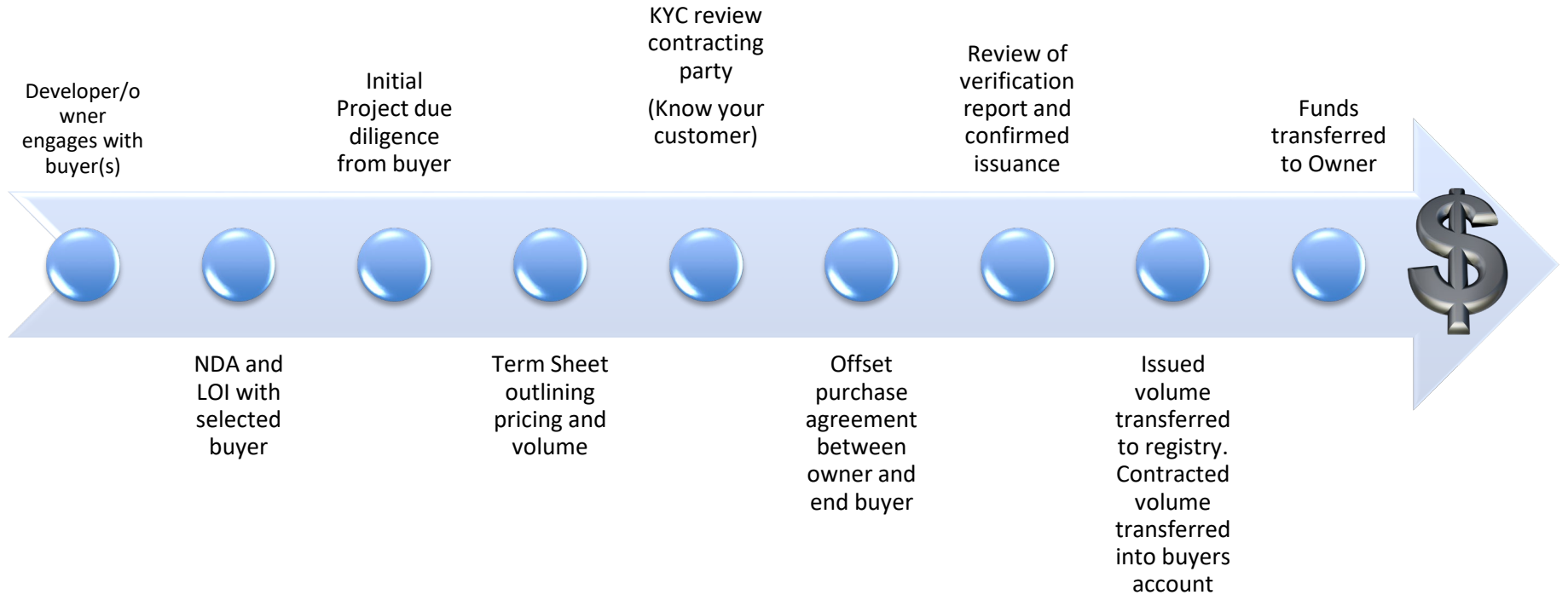
**Estimated volume for first phase (2020):** ~ 200 MT CO<sub>2</sub>

**Market Size:** ~\$2.4 Billion

**Issued ARBOC volume to date:** 151,945,993



# Offset Project Transaction



# Fixed Costs Development Assumptions

Development task	Description	Estimated costs (varies based on market program)
Project feasibility assessment	Initial project screening for eligibility and credit generation	\$15K - \$30K
Protocol/methodology development	Needed if no methodology exists	~\$100K
Project development	Implementation thru verification	~\$300K (varies based on project type and protocol)
Legal	Contracting with buyers, third parties, verifiers	~\$50K
Initial verification	Third party verifier site visit, desk review and verification report	\$75K
Annual verification	Based on protocol and market	\$40K
Registry fees	Fees based on issued volume	20 cents/ton (varies based on program)
Program annual fees	Based on specific program	\$500
Listing fees	Based on specific program	\$750

***Development costs can range from \$250K to \$500K depending on project type, location and standard***

# Sample pro forma – California Air Resources Board (CARB) Compliance Market Improved Forest Management (IFM) Offset Project

Project Assumptions	
Acres	50,000
Carbon density per acre (tCO2e)	67
Common Practice Value (CPV) per acre (tCO2e)	48
Tones per acre (tCO2e)	19
Gross volume first year delivery (tCO2e)	950,000
Regulatory Risk Buffer	21%
Net tones	750,500
Annual Growth rate	1.50%
Estimated Annual Carbon (tones)	320,000

Cost Estimate Assumptions*	
Inventory Costs per Plot	\$350
# of Plots (depends on project area)	400
Initial Site Visit Verification	\$75,000
Ongoing Annual Verification	\$40,000
Project Development	\$300,000
Legal	TBD
\$/CCO8	\$13
Rate of Price Increase	7.16%
Registration Fees/CCO	\$0.20
Listing fees	\$750
Annual Account	\$500
Discount rate	5%

Year	Site Verification					Site Verification					Site Verification	
	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
<b>REVENUE</b>	\$0	\$9,756,500.00	\$5,120,000	\$5,484,800	\$5,878,400	\$6,300,800	\$6,748,800	\$7,235,200	\$7,750,400	\$8,307,200	\$8,902,400	\$9,539,200
<b>COST Estimates</b>												
Project Development	\$300,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Registry fees		\$150,100	\$64,000	\$64,000	\$64,000	\$64,000	\$64,000	\$64,000	\$64,000	\$64,000	\$64,000	\$64,000
AB32 Program Fees	\$1,250	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500	\$500
Inventory	\$140,000	\$0	\$0	\$0	\$0	\$0	\$100,000	\$0	\$0	\$0	\$0	\$100,000
Ongoing Forest Management	\$0	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000
Verification	\$75,000	\$15,000	\$15,000	\$15,000	\$15,000	\$15,000	\$40,000	\$15,000	\$15,000	\$15,000	\$15,000	\$40,000
<b>TOTAL COSTS</b>	\$516,250	\$175,600	\$89,500	\$89,500	\$89,500	\$89,500	\$214,500	\$89,500	\$89,500	\$89,500	\$89,500	\$214,500
<b>NET REVENUE</b>	-\$516,250	\$9,580,900	\$5,030,500	\$5,395,300	\$5,788,900	\$6,211,300	\$6,534,300	\$7,145,700	\$7,660,900	\$8,217,700	\$8,812,900	\$9,324,700

<b>NPV GROSS REVENUE</b>	\$57,398,298
<b>NPV COST</b>	\$1,436,225
<b>NPV NET REVENUE</b>	\$55,962,073

# Key takeaways . . .

- Developing an offset project can be a very complicated, expensive and multilayered process
- Development costs can vary widely based on project type and standard
  - Forestry projects often carry higher fixed and variable costs
- Verification costs will always be higher than expected
- Compliance projects carry higher costs and layers of approvals
- Most buyers base engagement process on eligibility and credit generation.
  - Minimum volume threshold of ~ 30,000 MT CO<sub>2</sub>
- Early stage feasibility assessment is essential to determine project eligibility and financial returns

# Trends and looking forward . . .

## Compliance

- WCI expansion
- CORSIA
- Latin America
- Regional Programs



**PARIS2015**  
UN CLIMATE CHANGE CONFERENCE  
COP21•CMP11

## Voluntary

- Science Based Target initiatives
- Corporate disclosure initiatives
- Deforestation pledges



# Mahalo

[www.naturebank.com](http://www.naturebank.com)

**Steve Baczko**

**[Steve.baczko@naturebank.com](mailto:Steve.baczko@naturebank.com)**

**503-705-6605**

