



Northern Fishermen Co-Operative Society Ltd.

Leading climate action into the lobster fishing industry



GENERAL INFORMATION



Location: Belize City, Belize

Total lobster and conch production in 2024: **600.30 tons**



INTRODUCTION

Northern Fishermen Cooperative represents a pioneering effort to introduce systematic carbon accounting and climate action within Caribbean fisheries value chains. Established over six decades ago, the cooperative operates as Belize's premier producer-owned processor and distributor, serving a network of artisanal fishermen throughout the country. In 2025, Northern Fishermen Cooperative achieved Carbon Measured certification through Green Initiative, establishing its first comprehensive carbon footprint baseline for Caribbean Spiny Lobster and Queen Conch fishing operations.

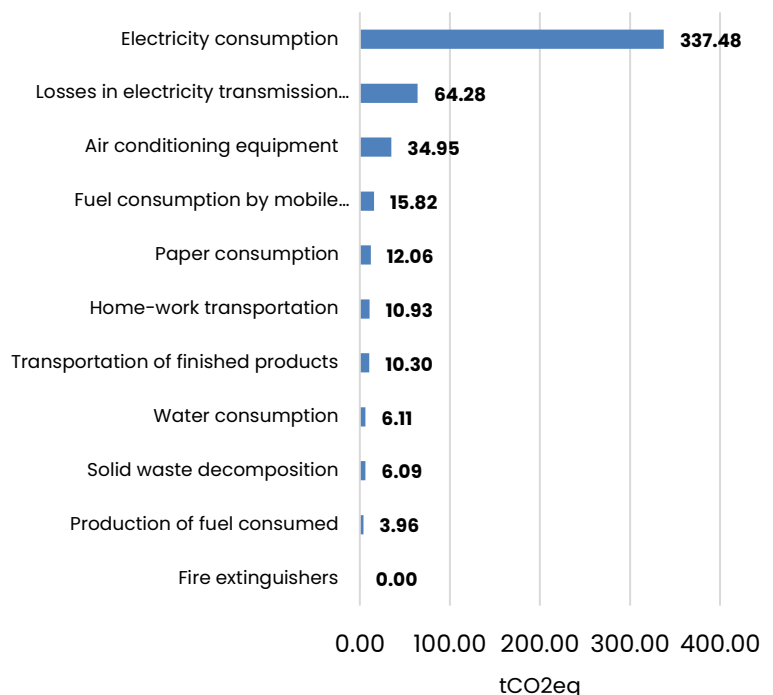
This assessment, conducted under ISO 14064-1:2018 standards, quantifies emissions across processing, cold storage, and distribution activities while documenting critical data gaps in capture operations that represent regional challenges common to cooperative fishing models. The cooperative maintains headquarters and processing facilities in Belize City, with strategic landing sites across the country, including a critical node at Caye Caulker serving productive fishing grounds.



CARBON FOOTPRINT

- **80.04%** of NFC total emissions are related to electricity consumption and distribution, used in **processing and refrigeration activities**.
- **10.12%** of NFC total emissions are related to Scope 1 emissions, related to fuel consumption from owned vehicles and air conditioning equipment. This does not include fuel used in catching operations, since they are conducted by member fishermen, rather than directly by NFC.
- Only **9.85% of the emissions** are related to scope 3 emissions such as transportation of finished products, paper and water consumption, solid waste decomposition.
- **Data limitation:** Capture operations emissions could not be quantified as independent member fishermen procure fuel through decentralized channels without systematic tracking—a challenge common across Caribbean fishing cooperatives.

GHG Emissions by source





EMISSIONS COMPARISON TO INDUSTRY BENCHMARKS

The quantified emissions intensity of **0.84 kgCO₂eq/kg** for **processing and distribution demonstrates operational efficiency**. Using the NFPCS regional benchmark (where capture operations represented 35% of total emissions), NFC's estimated complete emissions intensity is **1.29 kgCO₂eq/kg** of product, exceptionally favorable compared to Australian lobster fisheries (6.92–13.0 kgCO₂eq/kg).

This favorable performance derives from trap-based fishing methods requiring lower fuel consumption, geographic proximity to U.S. markets enabling maritime shipping (avoiding air freight), and centralized processing achieving economies of scale in cold storage operations.

Lobster fishery company benchmark	kgCO ₂ eq/kg of products
Northern Fishermen Cooperative – with estimated catching operations (low end)	1.29
National Fishermen Producers Cooperative Society (NFPCF)	2.29
Tropical rock lobster, live to Hong Kong	17.00
Tropical rock lobster, Frozen tail to USA	6.90



CURRENT CHALLENGES AND OPPORTUNITIES

Priority 1: Capture Operations Data Collection

Establishing **systematic fuel consumption tracking** represents the foundational requirement for comprehensive carbon management. Implementation pathways include developing simplified fuel reporting templates integrated with existing catch documentation systems, creating incentive structures linking sustainability data provision with market access benefits, exploring centralized fuel procurement programs enabling direct measurement, and piloting digital traceability systems that capture operational data.

Priority 2: Energy Efficiency in Cold Storage Operations

Optimize blast freezer operational practices through batch scheduling and temperature management, **implement facility insulation improvements** addressing thermal deficiencies, **evaluate equipment replacement opportunities** prioritizing most inefficient refrigeration units, and explore **solar photovoltaic integration** leveraging Belize's abundant solar resources and processing activities concentrated during daylight hours.

Priority 3: Capture Operations Decarbonization

Following successful data collection system establishment, **pursue fishing gear and method optimization** to minimize fuel consumption per unit catch, **implement vessel efficiency improvement** programs including propeller upgrades and hull maintenance, and **monitor emerging alternative propulsion technologies** for eventual adoption when commercially viable.

Priority 4: Processing Efficiency

Transition to **recycled-content cardboard packaging** reducing embodied emissions by 30–40%, **optimize packaging material utilization** through improved box sizing, and **implement water efficiency measures** reducing both carbon footprint and operating costs.



LOOKING FORWARD

Northern Fishermen Cooperative's Carbon Measured certification creates **tangible business value through enhanced market access and brand differentiation**, positioning products favorably with sustainability-conscious seafood buyers, restaurant chains, and institutional food service providers increasingly requiring environmental performance documentation.

The assessment establishes **methodological precedents for Caribbean fisheries carbon accounting**. Transparent documentation of data collection challenges, boundary definition decisions, and projection methodologies provides **replicable frameworks for similar fishing cooperatives throughout the region**. Regional coordination **facilitated by CRFM** offers opportunities for collective action through collaborative knowledge sharing platforms, collective procurement arrangements for efficiency equipment, and coordinated regional seafood branding programs that spread costs while accelerating decarbonization across Caribbean fishing sectors.

Achieving **meaningful carbon footprint reduction** while maintaining business viability requires **phased implementation balancing immediate operational improvements with longer-term infrastructure investments**. Northern Fishermen Cooperative's leadership in carbon accounting demonstrates that environmental responsibility and economic viability advance together in sustainable seafood value chains, contributing to broader Blue Economy development objectives and climate change mitigation goals throughout the Caribbean region.