GREENCORE ENERGY
HYDROGEN TECHNOLOGY

GREEN CORE ENERGY

Green Hydrogen Integral Project - Concordia, Entre Ríos – December 29, 2024

Executive Summary This project proposes the development of an integral productive framework in Concordia, Entre Ríos, focused on renewable energy generation, and green hydrogen production.

The initiative integrates technologies, for the treatment of solid urban waste (RSU) and biomass, electricity generation from biogas, production and commercialization of green hydrogen, sale of medical and industrial-grade oxygen, and the creation of infrastructure for hydrogen-based transportation and supply.

Executive Summary

This is a preliminary project proposal aimed at developing a fully integrated green hydrogen production system. The project consists of two key stages:

1. **Initial Stage**: Estimated investment of **U$S 3,200,000** with an execution timeline of **36 months**.
2. **Green Hydrogen Production Stage**: Estimated investment of **U$S 4,265,000** with an execution timeline of **18 months**.

The **total investment** required amounts to **U$S 7,465,000**, with a **repayment period of 10 years** at an annual interest rate of **6.5%**.

This document serves as a preliminary proposal, and I welcome any feedback or comments you may wish to share.

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Project Components

1. **Collection and treatment of RSU and Biomass**
    - Implementation of an integral system for selective waste collection.
    - Installation of modular biodigesters (GEA Group) with a capacity to process 20 tons per day of RSU and biomass.
    - Generation of biogas as the main input for energy production.
2. **Electricity generation from biogas**
    - Installation of a 500 kW turbine (Siemens Energy) to convert biogas into renewable electricity.
    - Integration of a cogeneration system (CHP) to utilize residual heat.
3. **Green hydrogen production**
    - Incorporation of alkaline or PEM electrolyzers with a 400 kW capacity, using the generated renewable electricity.
    - Estimated daily production: 200-240 kg of green hydrogen.
4. **Oxygen commercialization**
    - Capture and purification of oxygen generated as a by-product of the electrolysis process.
    - Sale of oxygen to companies like Air Liquide and Linde for medical and industrial applications.
5. **Transportation and fueling stations**
    - Initial purchase of 5 hydrogen-powered buses.
    - Installation of white-label fueling stations for hydrogen supply.
    - Creation of a sustainable logistics hub in Concordia.
6. **Social and environmental impact**

- Significant reduction of methane and CO2 emissions by transforming waste into energy.
- Local job creation during the construction and operation phases.
- Development of a circular economy in the region.

Implementation Plan

1. **Stage 1: Design and funding (0-6 months)**
    - Validation of the business model.
    - Negotiation of contracts with suppliers (GEA Group, Siemens Energy, Air Liquide, Linde).
    - Securing initial financing of $3 million.
2. **Stage 2: Installation and testing (6-18 months)**
    - Construction of infrastructure: biodigesters, power generators, and electrolyzers.
    - Acquisition of buses and fueling stations.
    - Pilot testing of production and distribution of hydrogen and oxygen.
3. **Stage 3: Operation and scaling (18-36 months)**
    - Start of commercial operations.
    - Scaling up hydrogen and oxygen production.
    - Expansion of the bus fleet and fueling stations.

Required Investment

Component	Estimated Cost (USD)
Biodigesters	500,000
Electric generator	600,000
Electrolyzers	400,000
Transportation infrastructure	1,000,000
Fueling stations	500,000
Others (maintenance, permits)	200,000
Total	**3,200,000**

Expected Returns

1. **Revenue from hydrogen sales**:
    - Average price: $10/kg.
    - Daily production: ~240 kg.
    - Annual revenue: $876,000.
2. **Revenue from oxygen sales**:
    - Average price: $100/ton.
    - Daily production: ~2 tons.
    - Annual revenue: $73,000.
3. **Savings from RSU utilization**:
    - Reduction of municipal costs for waste management.
4. **Indirect revenue**:
    - Job creation.
    - Increased tourism and investment in Concordia.

Conclusion The green hydrogen project in Concordia represents a unique opportunity to position the region as a leader in renewable energy and circular economy. The integration of cutting-edge technologies and its sustainable approach ensure economic viability and a lasting positive impact. We invite investors to join this transformation towards a cleaner and more sustainable future.

Report: Acquisition and Operation of Hydrogen-Powered Buses

1. Bus Acquisition

- **Quantity**: 5 hydrogen-powered buses.
- **Unit cost**: U$S 650,000.
- **Total cost**: U$S 3,250,000.
- **Specifications**:
    - Range: 300-400 km per charge.
    - Capacity: 40-50 passengers.
    - Charging time: 10-15 minutes per unit.

2. Service Station Conversion

- **Number of stations to convert**: 2 stations.
- **Location**: One in downtown Concordia and another at the northern entrance.
- **Conversion cost per station**: U$S 500,000.
- **Total cost**: U$S 1,000,000.
- **Conversion activities**:
    - Installation of hydrogen dispensers.
    - High-pressure storage tanks (700 bar).
    - Safety and monitoring systems.

3. Operating Costs and Fares

- **Fare**:
    - Proposed average fare: U$S 1.50 per trip.
    - Estimated passengers per day per bus: 1,000.
    - Daily revenue per bus: U$S 1,500.
    - Monthly revenue for 5 buses: U$S 225,000.
- **Daily operating cost per bus**: U$S 500 (includes energy, maintenance, and salaries).
- **Total monthly operating cost**: U$S 75,000.
- **Estimated gross monthly margin**: U$S 150,000.

4. Bus Advertising

- **Type of advertising**: Simple and local (vinyl wraps on the exterior of the buses).
- **Installation cost per bus**: U$S 3,000.
- **Total initial cost**: U$S 15,000.
- **Advertising revenue**:
    - Proposed rate: U$S 2,000 per bus per month.
    - Monthly revenue: U$S 10,000.
    - Annual revenue: U$S 120,000.

5. Environmental and Social Impact

- **Emission reduction**: Approximately 75 tons of CO2 per bus per year.
- **Social benefits**:
    - Creation of direct jobs: Drivers, maintenance personnel, and station operators.
    - Promotion of clean energy use in public transport.

6. Total Investment Summary

- Bus acquisition: U$S 3,250,000.
- Station conversion: U$S 1,000,000.
- Initial advertising: U$S 15,000.
- **Total**: U$S 4,265,000.

7. 10-Year Horizon for Capital and Interest Repayment

- **Initial financing**: U$S 4,265,000 at an annual rate of 6.5%.
- **Estimated annual installment (principal + interest)**: U$S 600,000.
- **Total repayment over 10 years**: U$S 6,000,000.

Projected Earnings to Sustain Repayment:

- **Annual revenue from fares**:
    - Estimated gross monthly margin: U$S 150,000.
    - Gross annual margin: U$S 1,800,000.
- **Annual advertising revenue**: U$S 120,000.
- **Total annual revenue**: U$S 1,920,000.
- **Annual operating costs**:
    - Bus operation: U$S 900,000.
- **Estimated net annual profit**: U$S 1,020,000.

Repayment Capacity:

- **Annual surplus after repayment**: U$S 420,000.
- **10-year accumulated surplus**: U$S 4,200,000 (after repaying principal and interest).

8. Conclusion and Recommendations The income structure generated by the project not only ensures repayment of the initial financing within 10 years but also generates a significant surplus for reinvestment or expansion. It is recommended to optimize operational cost management and explore partnerships with local entities to ensure a positive social and economic impact in Concordia.