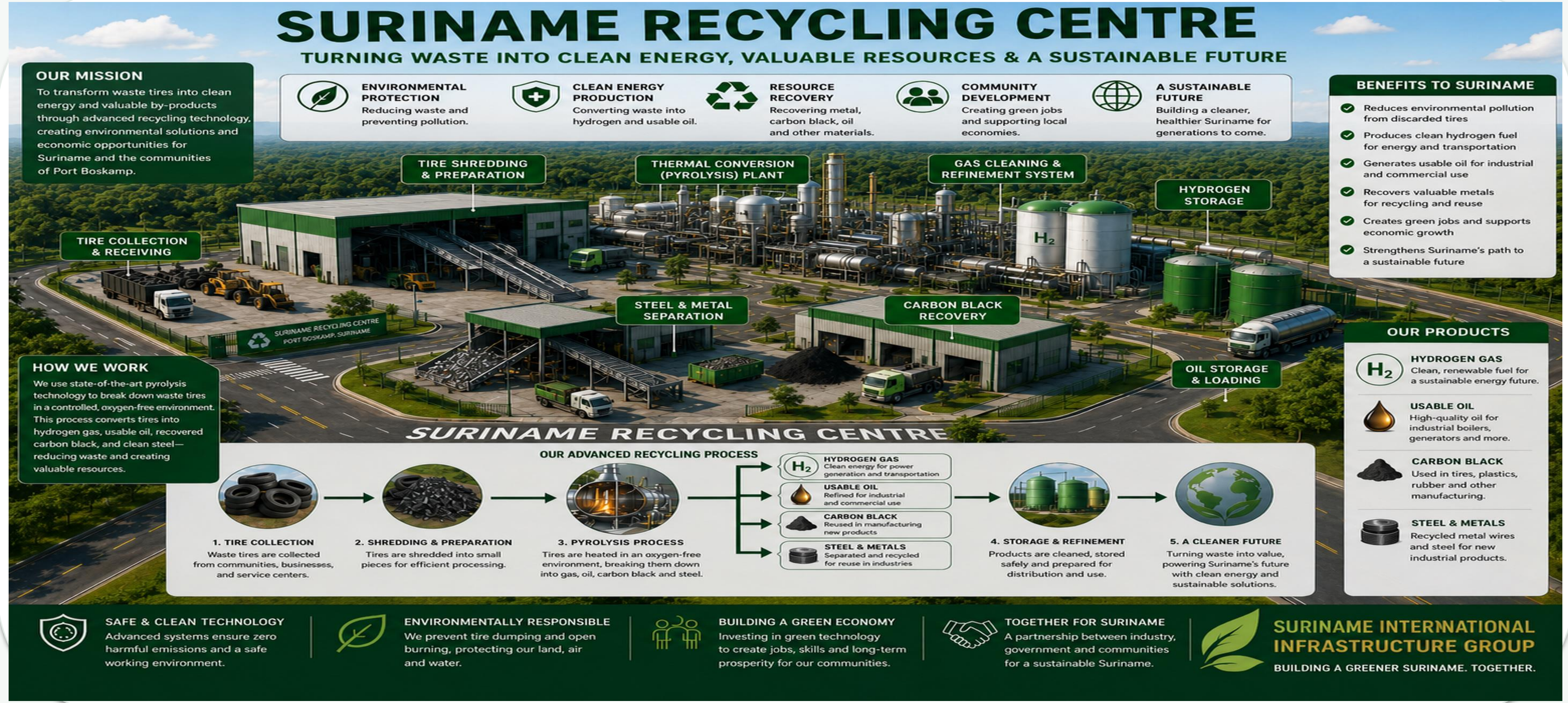
SURINAME RECYCLING CENTRE

Integrated Tire Recycling, Resource Recovery & Clean Energy Facility

Port Boskamp, Suriname • Professional Project Overview

Conceptual Facility Overview

Integrated collection, thermal conversion, resource recovery, refinement, storage and logistics



1. Executive Development Overview

A coordinated platform for recycling, energy recovery, resource recovery and industrial development

The Suriname Recycling Centre, as illustrated in the proposed conceptual development, is designed as a modern, integrated recycling and resource-recovery complex focused on converting end-of-life tires and other suitable hydrocarbon-based waste materials into commercially valuable products while significantly reducing the volume of waste requiring disposal. The facility is presented as an important component of Suriname's transition toward a cleaner, more circular economy, combining advanced materials recovery, thermal conversion, product refinement, environmental controls, storage, logistics, and industrial support infrastructure within one coordinated site. Rather than treating discarded tires simply as waste, the proposed centre is designed to treat them as an industrial feedstock from which energy products, recovered carbon materials, and recyclable metals can potentially be extracted. The overall concept supports several complementary objectives: environmental protection, waste reduction, local employment, industrial development, energy-resource recovery, and the establishment of a more sustainable waste-management infrastructure serving Port Boskamp and surrounding communities in Suriname.

INTEGRATED PROJECT CONCEPT

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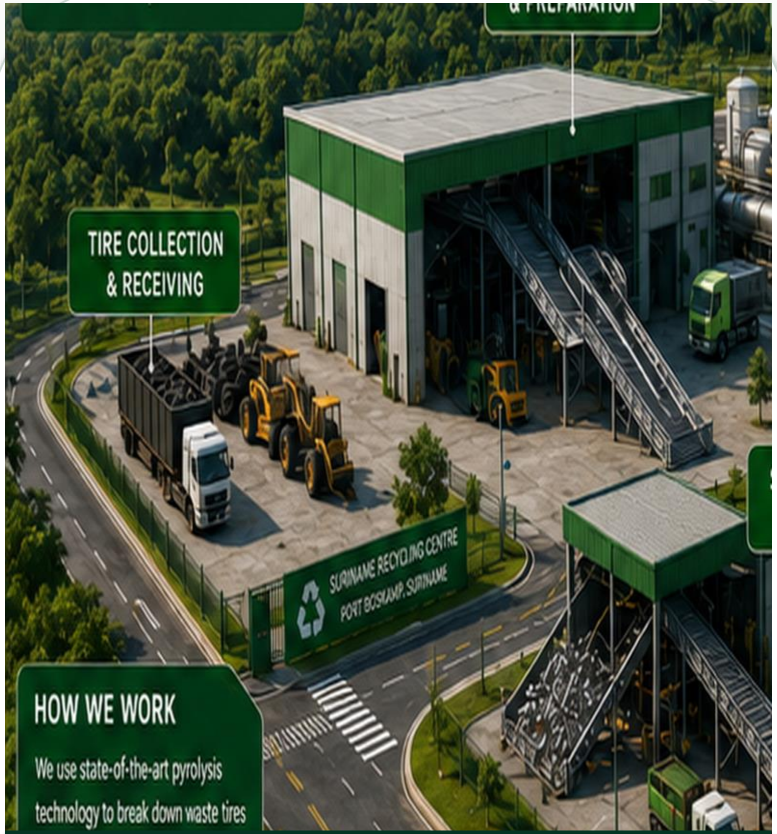
2. Tire Collection & Receiving

Controlled feedstock intake, documentation, staging and material handling

The process begins at the tire collection and receiving area, where used tires are delivered from communities, transportation companies, businesses, automotive service centres, industrial operations, and other collection points. The image shows a dedicated receiving area with trucks and material-handling equipment, demonstrating that the facility is intended to accommodate organized commercial-scale deliveries rather than informal dumping. Incoming tires would normally be weighed, documented, visually inspected, classified, and temporarily stored before entering the processing system. Proper receiving controls are important because they allow operators to track the quantity and source of incoming material, separate unacceptable contaminants, maintain inventory records, and establish reliable feedstock management. Heavy equipment such as loaders, forklifts, conveyors, and transport vehicles would be used to transfer the tires efficiently from the receiving yard into the processing building. By creating a structured collection system, the centre could help reduce abandoned tires, uncontrolled stockpiles, open burning, and other disposal practices that can create fire, health, and environmental hazards.



TIRE COLLECTION & RECEIVING

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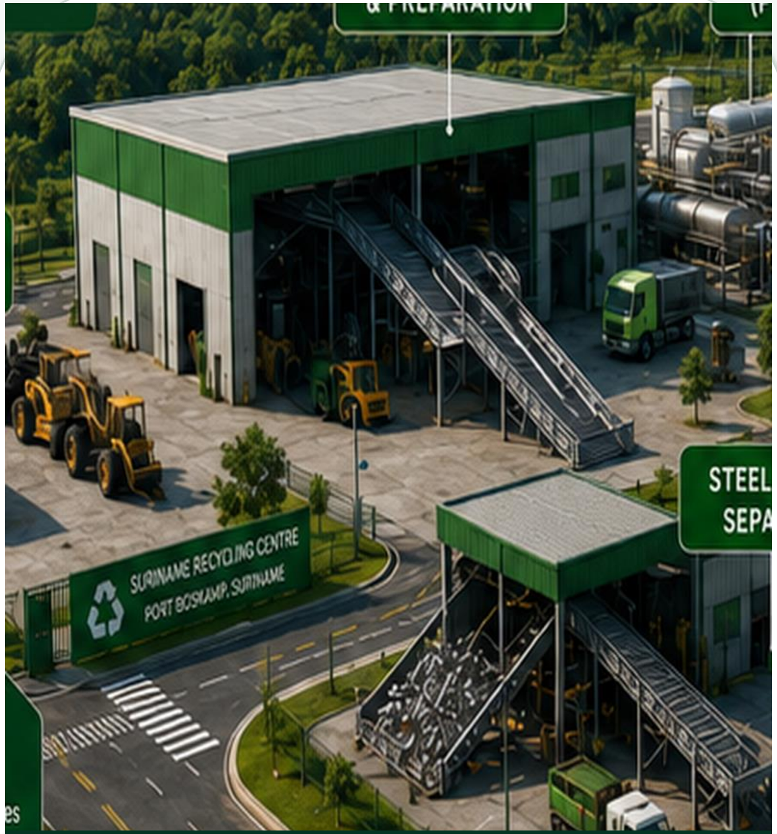
3. Tire Shredding & Preparation

Mechanical size reduction and preparation for efficient downstream thermal processing

The next major stage depicted is tire shredding and preparation. Whole tires are mechanically reduced into smaller, more uniform pieces before thermal processing. Industrial shredders, cutters, screens, magnetic separation equipment, and conveyor systems can be used to progressively reduce the tire material to the particle size required by the conversion technology. This preparation stage improves process consistency because smaller pieces provide more predictable heating characteristics and can be fed into the thermal conversion equipment at a controlled rate. During this stage, some of the steel reinforcement contained inside the tires may also begin to be separated. Proper preprocessing improves throughput, reduces mechanical problems downstream, and allows operators to create a continuous or semi-continuous feed system for the thermal conversion plant. The illustration clearly integrates the preparation building with conveyors feeding directly toward the central processing area, demonstrating a logical material-flow arrangement intended to minimize unnecessary handling.



SHREDDING & PREPARATION

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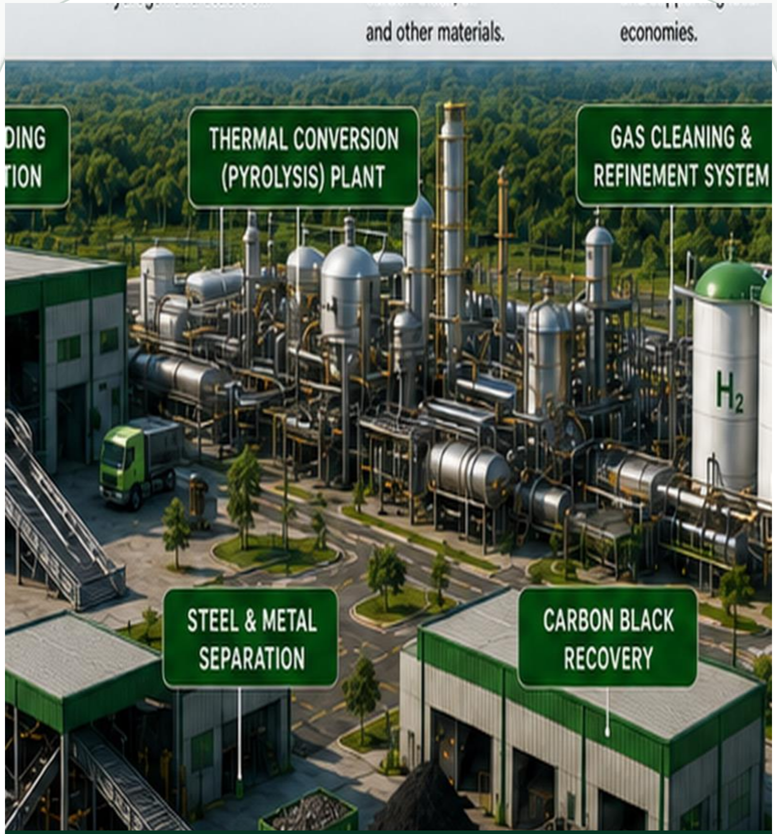
4. Thermal Conversion – Pyrolysis

The central conversion process transforms prepared tire material into multiple recoverable streams

At the heart of the development is the thermal conversion, or pyrolysis, plant. Pyrolysis is a controlled thermal process in which prepared tire material is heated at elevated temperatures in an oxygen-limited or oxygen-free environment. Because sufficient oxygen is not present for normal combustion, the tires are not simply burned. Instead, heat causes the rubber and other hydrocarbon materials to decompose into smaller molecular components. The resulting streams generally include a combustible process gas, condensable hydrocarbon vapors that can be recovered as pyrolysis oil, a solid carbon-rich residue commonly referred to as recovered carbon black or char, and the steel originally contained within the tire structure. The exact quantities and characteristics of each product depend on the tire composition, reactor technology, operating temperature, residence time, process pressure, feed preparation, and downstream refining equipment. The conceptual image shows a sophisticated central processing area incorporating reactors, vessels, piping, towers, heat-exchange equipment, process controls, and connected utility systems, suggesting a highly automated industrial operation rather than a simple recycling plant.



THERMAL CONVERSION / PYROLYSIS PLANT

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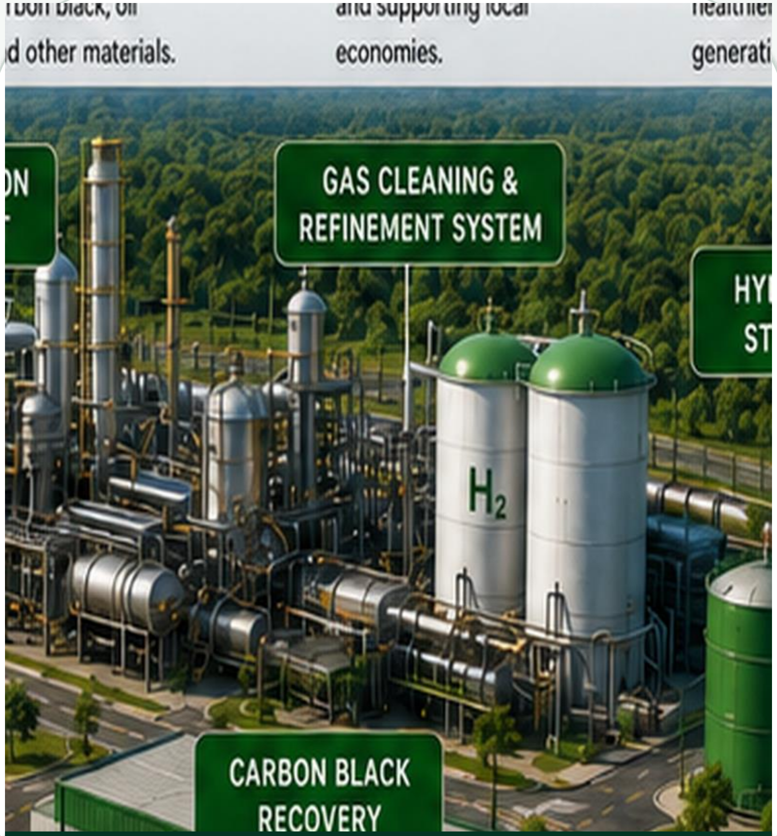
5. Gas Cleaning & Refinement

Process gas must be conditioned and purified before controlled reuse or further product recovery

The gas generated during thermal conversion is routed into a dedicated gas-cleaning and refinement system. Raw pyrolysis gas is not automatically a finished commercial fuel; it can contain hydrogen along with methane, other light hydrocarbons, carbon monoxide, carbon dioxide, moisture, particulates, sulfur compounds, and other trace constituents. For this reason, the image correctly identifies gas cleaning and refinement as a major downstream process area. Depending on the final system design, this section could incorporate filtration, cooling, condensation, scrubbing, sulfur removal, compression, catalytic processing, membrane separation, pressure-swing adsorption, or other purification technologies. Part of the cleaned process gas may potentially be reused within the plant to provide process heat, reducing the amount of outside fuel required to operate the pyrolysis reactors. If commercial-grade hydrogen is intended to be produced, additional processing and purification would normally be required to separate and concentrate the hydrogen to the purity and pressure specifications of the intended application. Depending on the composition of the produced gas, additional reforming or gas-conditioning equipment may also be required. The hydrogen-storage vessels shown in the image therefore represent the downstream portion of a broader hydrogen recovery and purification system rather than hydrogen being created as a single-step product directly from tire shredding.



GAS CLEANING & REFINEMENT

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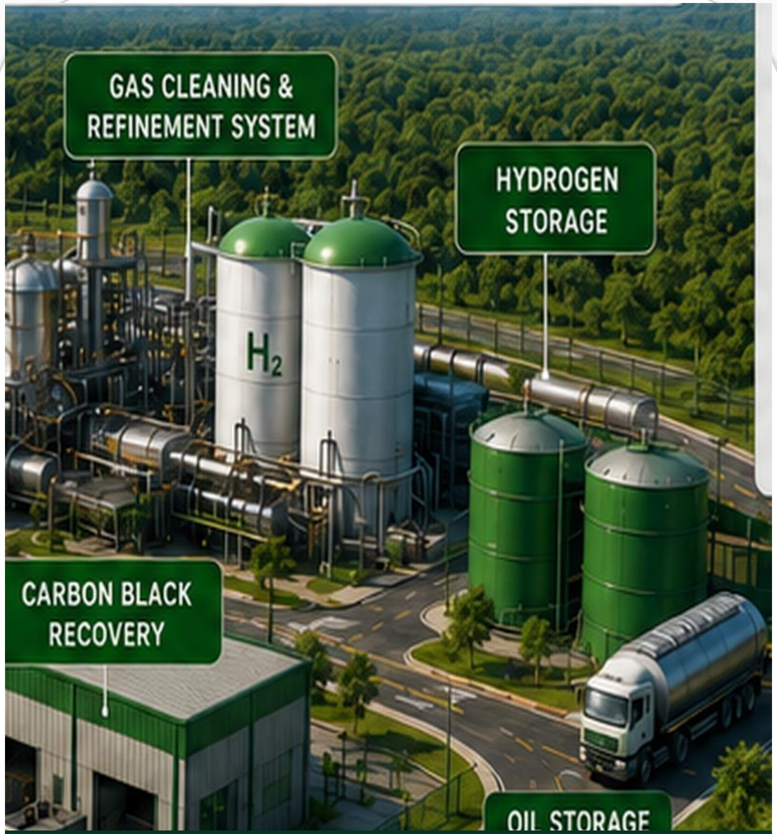
6. Hydrogen Recovery & Storage

A higher-value downstream energy product requiring specialized purification and safety systems

Once purified to the required specification, recovered hydrogen gas could potentially become one of the higher-value energy products associated with the facility. The illustration shows dedicated hydrogen storage vessels identified by the H_2 symbol, emphasizing the clean-energy element of the overall concept. Depending on purity, compression, permitting, economics, and end-user requirements, hydrogen could potentially support industrial applications, stationary power systems, fuel-cell applications, transportation projects, or other energy uses within the larger Port Boskamp development. A practical commercial installation would incorporate engineered compression systems, pressure-rated storage, leak detection, ventilation, emergency shutdown equipment, hazardous-area electrical classifications, fire protection, controlled access, continuous monitoring, and appropriate separation distances. Hydrogen storage and handling would therefore be managed as a specialized industrial operation integrated with the centre's overall process-safety system.



HYDROGEN STORAGE AREA

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7. Recovered Pyrolysis Oil

Condensed hydrocarbon liquid can be stored, tested and further processed for appropriate end uses

The pyrolysis oil or recovered hydrocarbon liquid represents another important product stream illustrated by the project. During thermal conversion, hydrocarbon vapors produced from the tire rubber are cooled and condensed into liquid. This material can potentially be stored and further processed for use as an industrial fuel or as feedstock for additional refining, depending on its chemical composition and applicable environmental and product-quality requirements. The image shows a dedicated oil storage and loading area, complete with storage vessels and tanker-truck access, indicating that the facility is envisioned with the necessary logistics infrastructure to hold recovered product and transfer it safely for commercial use or further treatment. Before sale or use, the oil would typically be tested for characteristics such as water content, sulfur, viscosity, density, flash point, contaminants, and heating value. Secondary treatment or blending may be required depending on the intended market.

OIL STORAGE & LOADING

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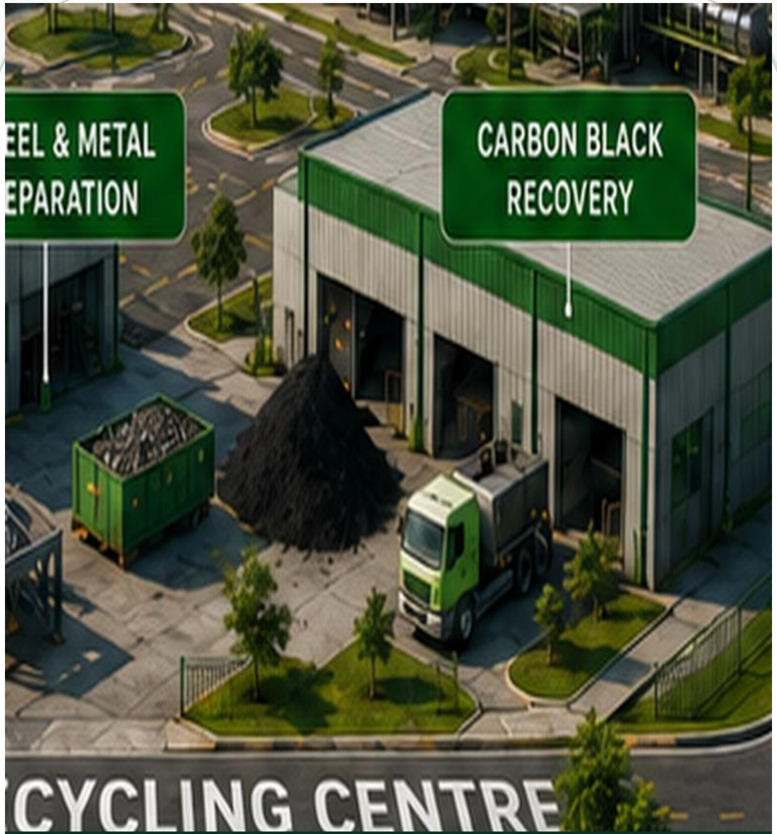
8. Carbon Black Recovery

Solid carbon-rich material can be recovered, processed and prepared for reuse

The facility also incorporates carbon black recovery, another potentially significant material-recovery opportunity. After the volatile portion of the tire material has been converted into gas and oil, a carbon-rich solid remains. This recovered material can contain carbon black, mineral ash, additives, and other constituents originating from the original tire formulation. The illustration depicts a dedicated carbon black recovery building where this material could be cooled, processed, separated, milled, pelletized, packaged, or otherwise prepared for reuse. Higher-quality recovered carbon black can potentially be used in selected rubber, plastic, construction, composite, or industrial applications, although the final value depends heavily on purity and processing quality. Creating a marketable recovered carbon product can significantly improve the economics of tire recycling because it converts another waste stream into a potential commercial material.



CARBON BLACK RECOVERY

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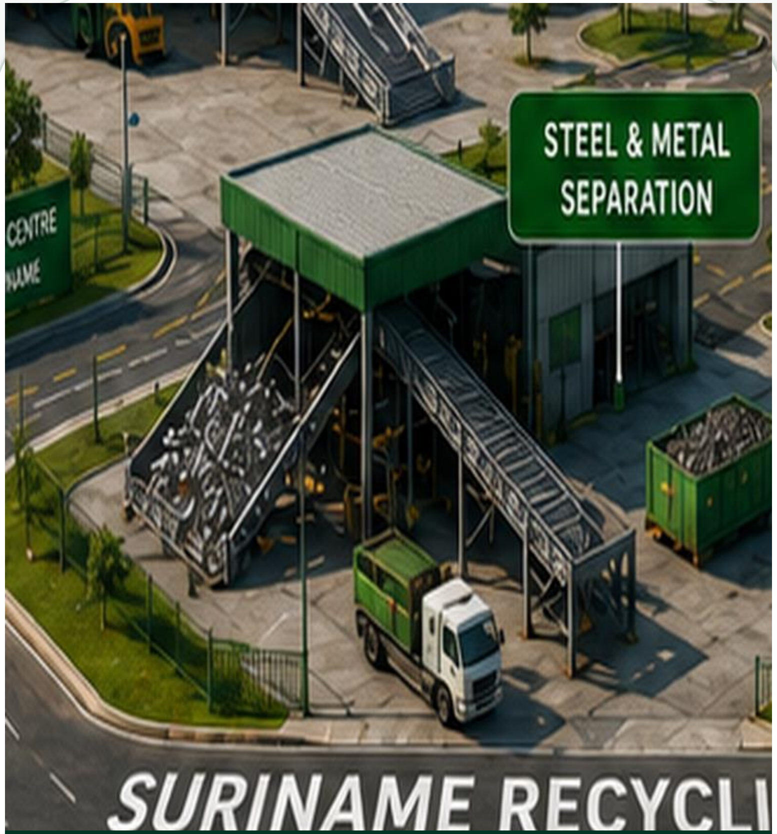
9. Steel & Metal Separation

Reinforcing steel is separated and returned to existing metal recycling markets

A separate steel and metal separation system is shown as an integral part of the centre. Tires contain substantial quantities of reinforcing steel, particularly within their belts and bead structures. During shredding and thermal conversion, this steel can be liberated from the rubber and recovered using magnetic and mechanical separation equipment. The recovered metal can then be cleaned, consolidated, and sold into existing scrap-metal and steel-recycling markets. This supports the circular-economy objective of the development by recovering a material that would otherwise remain trapped within discarded tires or be sent to landfill. The centre therefore seeks to maximize the percentage of each incoming tire that is converted into a usable product rather than merely reducing tire volume.



STEEL & METAL SEPARATION

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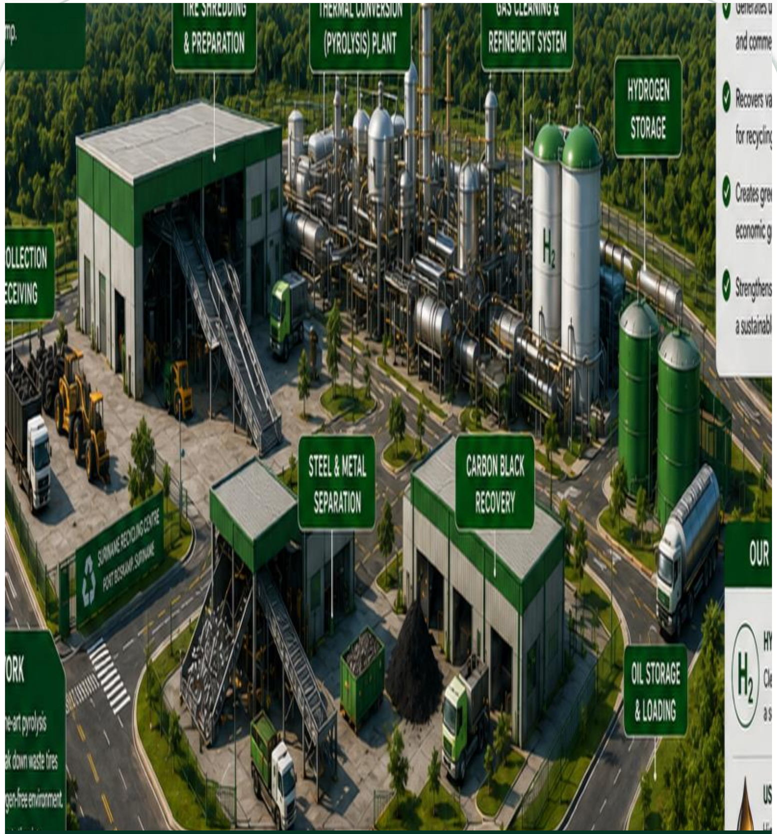
10. Integrated Industrial Campus

Roads, process zones, storage, security and logistics are planned as one operating system

From an operational standpoint, the image presents the Suriname Recycling Centre as a fully integrated industrial campus. Dedicated internal roads allow trucks to enter the collection area, move between processing and storage zones, and access product-loading areas without interfering with core processing operations. Separate buildings house shredding, preparation, metal separation, carbon recovery, and supporting equipment, while the primary thermal-processing area occupies the centre of the complex. Storage tanks and process vessels are positioned in dedicated zones, with landscaping, security fencing, controlled entrances, and significant separation between operational areas. This type of layout can help improve safety, maintenance access, emergency response, traffic management, product handling, and future expansion. The surrounding green landscape shown in the concept also emphasizes the project's intended integration with Suriname’s environment rather than presenting the development as a conventional unmanaged waste facility.



INTEGRATED INDUSTRIAL CAMPUS

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11. Environmental Controls, Safety & Automation

Engineered containment, monitoring, protection and emergency-response systems are fundamental

An industrial facility of this nature would also require a substantial environmental-control and safety infrastructure behind the visible processing equipment. Appropriate systems would normally include air-emissions control, process-gas monitoring, wastewater management, stormwater containment, fire-water supply, fire detection and suppression, spill containment, secondary containment around tanks, emergency shutdown systems, electrical protection, backup power, ventilation, occupational safety programs, and continuous environmental monitoring. Process temperatures, pressures, gas concentrations, equipment conditions, and storage levels would be monitored through a centralized control system. Modern automation could allow operators to monitor the entire plant from a central control room and rapidly isolate equipment in the event of abnormal operating conditions. These systems are essential to ensure that the facility achieves the environmental benefits presented in the conceptual image.

ENVIRONMENTAL & PROCESS-CONTROL CONTEXT

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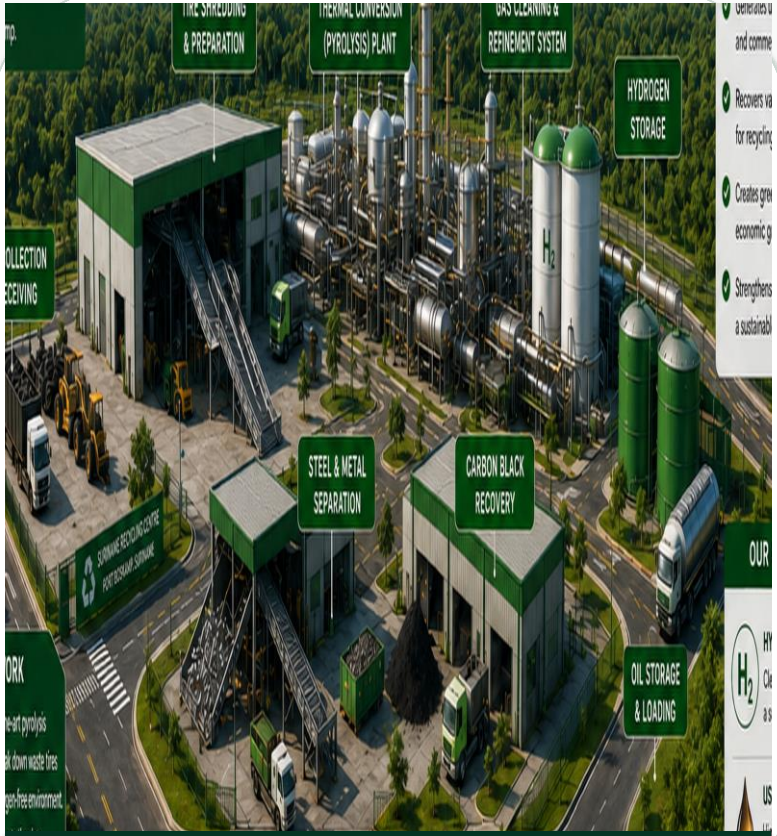
12. Economic & Community Development

The facility can support direct jobs, indirect jobs, technical training and local supply chains

The project could provide significant economic and community-development benefits if successfully developed and operated. Construction would require engineering, civil works, mechanical installation, electrical systems, logistics, commissioning, and local support services. Once operational, the centre could create permanent positions in plant operations, maintenance, administration, transportation, materials handling, quality control, environmental compliance, security, and management. Indirect employment could also be generated through tire collection, trucking, equipment servicing, metal recycling, product distribution, and local supply chains. Training programs associated with the centre could help develop specialized technical skills in recycling, process operations, hydrogen handling, industrial automation, and environmental management.



INDUSTRIAL DEVELOPMENT & EMPLOYMENT PLATFORM

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13. Circular-Economy Process Model

Five stages connect waste management to manufacturing, energy recovery and resource conservation

From a broader strategic perspective, the Suriname Recycling Centre is intended to demonstrate how waste can be treated as a recoverable resource rather than a long-term environmental liability. The five-stage process illustrated across the bottom of the image summarizes the concept clearly: 1) tires are collected; 2) they are shredded and prepared; 3) the material undergoes controlled thermal conversion; 4) the resulting gas, liquids, carbon materials, and metals are separated, cleaned, refined, and stored; and 5) recovered products are returned to productive economic use instead of being discarded. The process therefore connects waste management with industrial manufacturing, energy recovery, recycling, and resource conservation.

FIVE-STAGE RECYCLING PROCESS

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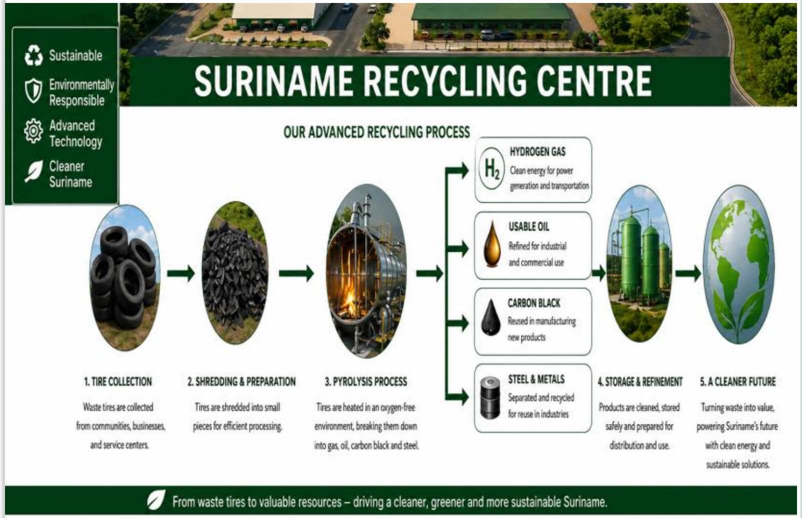
14. Strategic Conclusion

A long-term industrial platform built around recovering value from materials that would otherwise be discarded

Ultimately, the proposed Suriname Recycling Centre at Port Boskamp is depicted as more than a tire-disposal facility. It represents a potential environmental and industrial platform capable of combining waste reduction, advanced recycling, energy recovery, material reclamation, hydrogen-related development, and local economic opportunity within a single coordinated operation. Its success would depend on the final engineering design, feedstock availability, product specifications, environmental approvals, technology selection, commercial markets, and rigorous operational controls. Properly engineered and managed, however, the centre could support Suriname’s objectives of reducing uncontrolled waste, recovering valuable materials, developing new industrial capabilities, and establishing a cleaner and more sustainable infrastructure for future generations. The concept presented in the image therefore communicates a clear long-term vision: collect waste responsibly, recover as much value as technically and economically possible, control environmental impacts, create useful products, and build a circular industrial economy around resources that would otherwise be discarded.



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PORT BOSKAMP

Connect with Port Boskamp

Port Boskamp, Boskamp, Saramacca District, Suriname

Phone: +519-694-7780

Info@portboskamp.com

Connect with John Van Dyke

Invest@portboskamp.com

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