

TRUCK REFRIGERATION SOLAR-ASSIST RETROFIT

Reduce Reefer Fuel Consumption
Without Replacing the
Existing Refrigeration System

A Patent-Pending Solar Thermal Retrofit
for Refrigerated Trailers



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IMPORTANT DISCLOSURES

The solar thermal technology described herein is **patent pending**. Patent applications have been filed; however, no patents have yet been issued. Product names, trademarks, and branding referenced throughout this document are working names and should not be interpreted as registered trademarks unless otherwise indicated.

Certain engineering details relating to the collector architecture, BlueNanofluid™ working fluid, thermal storage system, and associated technologies are proprietary trade secrets and are intentionally omitted from this overview.

Unless otherwise stated, all performance figures, fuel savings, operating costs, customer payback periods, and financial projections contained herein are engineering estimates based upon industry benchmarks, computer modeling, and internal design assumptions. These estimates have **not yet been validated through third-party field testing** of the demonstration system. Actual performance will vary depending upon equipment configuration, operating conditions, climate, solar availability, vehicle utilization, maintenance practices, and numerous other factors.

Forward-looking statements contained in this document reflect management's current expectations regarding future events, commercial opportunities, and anticipated business performance. Actual results may differ materially from those expressed or implied.

Development Status

- ✓ Patent applications filed
- ✓ Engineering design completed
- ✓ Demonstration unit funded through current raise
- ✓ Third-party field validation pending

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EXECUTIVE SUMMARY

US Gas & Energy is seeking to collaborate with Refrigerated Trucking companies in our **"USG&E Transportation Pilot Program"** a **patent-pending solar thermal retrofit system** designed for refrigerated truck trailers ("reefers").

The system captures solar thermal energy from the roof of an existing refrigerated trailer and uses that energy to reduce the diesel fuel required to operate the trailer's refrigeration unit. Unlike alternative technologies that require fleets to replace existing equipment, this solution is designed as a **retrofit**, allowing operators to retain the refrigeration systems they already own while significantly reducing fuel consumption, operating costs, and emissions.

This approach addresses one of the largest operating expenses in the refrigerated transportation industry. A typical refrigerated trailer consumes approximately **15–25 gallons of diesel fuel per day** solely to power its refrigeration unit, representing an annual operating cost of **\$20,000–\$35,000 per trailer**, depending on utilization. Even modest reductions in fuel consumption can produce substantial savings across large commercial fleets.

The underlying technology has been designed and engineered by **New Blue Solution (NBS)** under an exclusive distribution and licensing agreement with US Gas & Energy covering the refrigerated trucking and cold-chain markets. The technology combines proprietary solar thermal collection, advanced heat-transfer engineering, BlueNanofluid™, passive StarFlow™ circulation, thermal energy storage, and power generation into a single integrated platform designed to maximize thermal efficiency while extending useful energy production beyond daylight hours.

Unlike conventional solar technologies, this system does **not** replace the existing refrigeration unit. Instead, it works alongside the existing diesel-powered reefer, reducing engine runtime and fuel consumption while preserving the fleet's existing equipment, maintenance procedures, and driver training. This dramatically lowers adoption risk while providing a clear and measurable return on investment.

The refrigerated trucking industry was intentionally selected as the initial commercial market because it combines several characteristics that make successful commercialization highly attractive:

- Large and measurable fuel expense
- Continuous daytime solar exposure
- Existing fleet infrastructure requiring no major modifications
- Straightforward retrofit installation
- Easily verified customer savings
- Significant opportunities for recurring maintenance and consumable revenue

The field validation of the first demonstration unit testing will support commercial deployment, pilot fleet installations, and a planned follow-on growth round to accelerate market expansion.

HOW THE TECHNOLOGY WORKS

The US Gas & Energy Solar-Assist Retrofit captures solar thermal energy from the roof of a refrigerated trailer and converts that heat into useful energy that assists the trailer's existing diesel-powered refrigeration system.

Rather than replacing the refrigeration unit, the system works alongside it, reducing the amount of diesel fuel required to maintain cargo temperatures while preserving the fleet's existing equipment, maintenance procedures, and operating practices.

The technology integrates several proprietary innovations developed by New Blue Solution (NBS), including:

Solar Thermal Collection

A patent-pending low-profile collector mounted on the trailer roof captures and concentrates solar energy throughout the day while remaining aerodynamic and compatible with standard trailer clearances.

BlueNanofluid™

A proprietary heat-transfer fluid rapidly absorbs thermal energy and transports it throughout the system with exceptional thermal efficiency while retaining usable heat well after sunset.

StarFlow™ Passive Circulation

Instead of relying on mechanical pumps, the system uses NBS's proprietary StarFlow™ thermosiphon circulation architecture to move heated fluid naturally through the system. This passive design improves reliability while reducing maintenance requirements and parasitic energy consumption.

Thermal Energy Storage

Captured heat is stored within the system and remains available after sunset, allowing the retrofit to continue contributing useful thermal energy during evening and overnight operation.

Integrated Power Generation

Recovered thermal energy may also be used to drive an Organic Rankine Cycle (ORC) or Stirling engine to generate electrical power for refrigeration controls, lighting, sensors, and auxiliary systems, further reducing diesel engine runtime.

Why It's Different

Unlike conventional solar technologies that produce either heat or electricity, the NBS platform integrates multiple thermal engineering innovations into a single system that:

- Captures more usable solar energy
- Transfers heat more efficiently
- Stores thermal energy for extended operation
- Operates using passive circulation rather than mechanical pumps
- Assists existing refrigeration equipment instead of replacing it
- Is designed to reduce diesel fuel consumption while lowering operating costs and emissions

While each individual engineering principle is well understood, the patent-pending innovation lies in the integration of these technologies into a single, highly efficient solar thermal platform optimized for commercial refrigeration applications.

Development Status

- Patent applications filed
- Engineering design substantially completed
- Prototype demonstration unit funded through this investment
- Field validation planned with commercial fleet operators
- Commercial deployment to follow successful validation

Appendix A provides a detailed technical overview of the underlying technology, including the complete explanation of the twenty-one integrated engineering mechanisms that form the basis of the patent-pending system.

THE REFRIGERATED TRUCKING OPPORTUNITY

Refrigerated transportation is one of the most energy-intensive segments of the trucking industry. Every day, thousands of refrigerated trailers ("reefers") burn diesel fuel solely to maintain cargo temperatures during transport. This represents a significant and ongoing operating expense for fleet operators.

A typical refrigerated trailer consumes **15 to 25 gallons of diesel fuel per day** to power its refrigeration unit, depending on ambient temperatures, cargo, equipment age, and operating conditions. At today's diesel prices, refrigeration alone can cost **\$20,000 to \$35,000 annually per trailer**.

For commercial fleets, these operating costs scale dramatically.

Fleet Size	Estimated Annual Refrigeration Fuel Cost
10 Trailers	~\$292,000
50 Trailers	~\$1.46 Million
100 Trailers	~\$2.92 Million
500 Trailers	~\$14.6 Million
1,000 Trailers	~\$29.2 Million

Even modest improvements in fuel efficiency can produce millions of dollars in annual savings for large fleet operators while simultaneously reducing engine hours, maintenance costs, emissions, and idling.

Why This Market?

The refrigerated trucking industry offers an ideal first commercial application for the US Gas & Energy Solar-Assist Retrofit because it possesses several characteristics that support rapid adoption.

Large Operating Expense

Fleet operators closely monitor diesel consumption, making fuel savings immediately measurable and financially meaningful.

Existing Installed Base

Hundreds of thousands of refrigerated trailers are already in operation. Because the system is designed as a retrofit, customers can improve existing assets without purchasing new trailers or replacing existing refrigeration equipment.

Continuous Solar Exposure

Trailer roofs receive unobstructed sunlight throughout the day, providing an ideal platform for capturing solar thermal energy.

Straightforward Installation

The low-profile collector is designed for rooftop installation without materially changing trailer dimensions or interfering with existing refrigeration equipment.

Easy Return on Investment

Unlike many energy technologies whose savings are difficult to quantify, refrigerated fleets already measure fuel consumption in detail, making return on investment simple to calculate and verify.

Why Fleets Will Buy It

The strongest feature of this technology is its simplicity from the customer's perspective.

Fleet operators do not need to change refrigeration systems, retrain drivers, or modify maintenance procedures.

Instead, they simply continue operating the refrigeration equipment they already trust while reducing the amount of diesel fuel it consumes.

That significantly lowers the barriers to adoption and shortens the commercial sales cycle.

HOW THE SOLAR-ASSIST RETROFIT WORKS

— CAPTURING SOLAR ENERGY. REDUCING DIESEL CONSUMPTION. LOWERING COSTS. —

1 SUNLIGHT

Solar energy from the sun is captured throughout the day.



2 ROOF-MOUNTED MacSunPod™

The low-profile, patent-pending MacSunPod™ collector captures and concentrates solar thermal energy on the trailer roof.



3 BLUENANOFLUID™

Proprietary BlueNanoFluid™ rapidly absorbs heat and transports it throughout the system with exceptional efficiency.



4 STARFLOW™ PASSIVE CIRCULATION

StarFlow™ thermosiphon circulation moves heated fluid naturally—no pumps, lower maintenance, higher reliability.



5 EXISTING REEFER UNIT

Captured thermal energy assists the trailer's existing refrigeration unit—reducing diesel runtime while maintaining temperature.



6 REDUCED DIESEL CONSUMPTION

Less diesel burned. Lower operating costs. Fewer emissions. Higher profits.



SAVE FUEL.
SAVE MONEY.
REDUCE EMISSIONS.



LOWER FUEL COSTS

Reduce diesel consumption by 20% to 50%+ depending on conditions.



REDUCE EMISSIONS

Lower CO₂ and other emissions while supporting sustainability goals.



LESS WEAR & MAINTENANCE

Reduced engine runtime means less wear, lower maintenance, longer life.



DAY & NIGHT PERFORMANCE

Thermal energy is stored and available after sunset for continued assistance.



STRONG ROI

Fast payback. Measurable savings. Immediate impact on your bottom line.

A PATENT-PENDING SOLAR THERMAL RETROFIT FOR REFRIGERATED TRAILERS

Designed to work with the equipment you already have. Built to save fuel, lower costs, and deliver results.

COMMERCIALIZATION STRATEGY

US Gas & Energy's commercialization strategy is designed to accelerate adoption by targeting customers with the highest fuel consumption and the fastest return on investment.

Rather than pursuing broad consumer marketing, the Company will focus on commercial fleet operators whose fuel costs are substantial, measurable, and continuously monitored. Because refrigerated fleets already track diesel consumption by vehicle, the value of the Solar-Assist Retrofit can be demonstrated using actual operating data.

Phase 1 — Demonstration & Validation

The initial demonstration unit will be installed and tested under real-world operating conditions to validate fuel savings, thermal performance, system reliability, and ease of installation.

The resulting operating data will form the basis for future customer case studies and commercial sales.

Phase 2 — Pilot Fleet Installations

Following successful validation, the Company will partner with selected fleet operators to install pilot systems across multiple trailers.

These installations will provide fleet-specific performance data while demonstrating scalability under a variety of operating conditions and climates.

Phase 3 — Commercial Sales

Commercial deployment will focus on:

- Refrigerated trucking fleets
- Third-party logistics (3PL) providers
- Food distributors
- Cold-chain transportation companies
- Trailer dealers and refrigeration service organizations

Strategic partnerships with trailer manufacturers, refrigeration equipment distributors, and financing providers will help accelerate adoption while minimizing upfront capital requirements for customers.

Competitive Advantage

The Company's market strategy is built around one simple message:

"We don't replace your refrigeration system. We reduce the fuel it burns."

This positioning removes one of the largest barriers to adoption. Fleet operators retain the refrigeration systems they already own, trust, and service while reducing fuel consumption, operating costs, and emissions through a straightforward retrofit.

By complementing existing equipment rather than replacing it, the Solar-Assist Retrofit lowers implementation risk, shortens sales cycles, and provides a compelling economic case for fleet operators.

Milestones & Use of Proceeds

Stage	Objective
Prototype Testing	Build Transportation industry partners for the USG&E Transportation Pilot Program. Validate performance and fuel savings
Pilot Fleet Deployment	Install systems with commercial fleet partners
Commercial Launch	Begin initial sales and customer installations
Growth Capital	Expand manufacturing and national distribution

LEADERSHIP TEAM

The US Gas & Energy Solar-Assist Refrigeration Retrofit combines experienced commercial leadership with advanced thermal engineering expertise through its strategic partnership with New Blue Solution (NBS).

Together, the team brings decades of experience in energy systems, engineering, manufacturing, commercialization, business development, and technology licensing.

Ted Corbett

Founder & Chief Executive Officer

Ted Corbett leads the commercial development of US Gas & Energy, including strategic partnerships, customer development, fundraising, and commercialization of the Company's refrigerated transportation platform.

He has extensive experience building business relationships and identifying market opportunities across the energy sector, with a particular focus on bringing innovative technologies to commercial markets.

Don MacLean

Founder, New Blue Solution (NBS)

Don MacLean is the principal inventor and engineering architect behind the Company's proprietary solar thermal technologies.

His work includes the development of the MacSunPod™, BlueNanofluid™, StarFlow™ circulation, advanced thermal storage systems, and numerous integrated thermal management technologies designed to improve energy efficiency across multiple industries.

He leads all engineering design, prototype development, system integration, and technical validation.

Victor Kubicek

NBS Business Development & Strategic Partnerships

Victor Kubicek is responsible for strategic partnerships, investor relations, licensing opportunities, and commercialization initiatives.

He has led business development efforts across multiple industries, helping establish relationships with investors, government agencies, commercial partners, and international organizations while supporting the expansion of New Blue Solution technologies into new markets.

Strategic Partnership

US Gas & Energy serves as the commercial partner for refrigerated transportation applications, while New Blue Solution provides the underlying engineering, technology development, and ongoing technical support.

This collaboration allows each organization to focus on its core strengths—commercial execution and customer relationships on one side, advanced engineering and product innovation on the other.

ABOUT OUR ENGINEERING PARTNER

New Blue Solution (NBS)

The Solar-Assist Refrigeration Retrofit described in this memorandum is powered by proprietary thermal technologies developed by **New Blue Solution (NBS)**, an engineering company specializing in advanced solar thermal systems, thermal energy storage, heat transfer, and energy efficiency technologies.

US Gas & Energy has secured an **exclusive distribution and licensing agreement** covering refrigerated trucking and other designated commercial sectors, allowing it to focus exclusively on commercialization while NBS continues advancing the underlying technology platform.

This relationship provides investors with confidence that the refrigerated trucking opportunity is supported by an experienced engineering organization rather than a single-product startup.

Technology Platform

The refrigerated trucking retrofit is one commercial application of a broader family of proprietary thermal technologies, including:

- MacSunPod™ solar thermal collectors
- BlueNanofluid™ advanced heat-transfer fluid
- StarFlow™ passive circulation
- Thermal energy storage
- Organic Rankine Cycle (ORC) integration
- Industrial process heat recovery
- Solar-powered water treatment and desalination

These technologies share common engineering principles while serving different commercial markets.

Selected Commercial Engagements

Market	Current Activity
Refrigerated Transportation	Solar thermal retrofit commercialization
Data Centers	Thermal cooling and energy reduction design
Industrial Energy	Process heat recovery applications

Market	Current Activity
Hospitality & Resorts	Renewable thermal energy systems
Municipal Infrastructure	Solar thermal and water treatment
Disaster Relief	Off-grid energy and water systems
International Distribution	Europe, Caribbean, and West Africa

Exclusive Commercial Rights

US Gas & Energy operates under an Exclusive Distribution and License Agreement with New Blue Solution (NBS).

The agreement grants US Gas & Energy exclusive commercialization rights within designated market sectors, including:

- Refrigerated trucking fleets
- Commercial transportation
- Cold-chain logistics
- Cold-storage facilities
- Refrigerated warehousing
- Convenience stores
- Supermarkets
- Fuel retail facilities
- Other designated commercial refrigeration applications

The agreement provides US Gas & Energy with exclusive market access while allowing NBS to continue developing and supporting the underlying technology platform.

APPENDIX A

TECHNICAL OVERVIEW

Solar-Assist Refrigeration Technology

The US Gas And Energy Solar-Assist Refrigeration Retrofit is a patent-pending solar thermal platform designed to reduce the diesel fuel consumed by refrigerated trailers by capturing solar energy and converting it into usable thermal energy.

Unlike photovoltaic systems that first convert sunlight into electricity, the MacSunPod™ collector captures solar radiation directly as heat. This thermal energy is transported through the system by BlueNanofluid™ and managed through New Blue Solution's proprietary StarFlow™ circulation architecture before being applied to assist the trailer's refrigeration system. The technology is intended to reduce compressor workload, extend thermal availability beyond daylight hours, and decrease overall diesel engine runtime.

System Architecture

The complete system consists of six integrated subsystems:

1. MacSunPod™ Solar Thermal Collector

A low-profile roof-mounted solar thermal collector captures incoming solar radiation and converts it into usable thermal energy while maintaining an aerodynamic profile suitable for commercial refrigerated trailers.

2. BlueNanofluid™

BlueNanofluid™ is NBS's proprietary heat-transfer fluid engineered to efficiently absorb, transport, and retain thermal energy throughout the operating cycle.

The formulation remains proprietary and is not disclosed within this memorandum.

3. StarFlow™ Passive Circulation

The StarFlow™ circulation system uses thermosiphon principles to circulate heated fluid without conventional circulation pumps.

By relying upon natural convection rather than continuously operating mechanical pumps, the system is designed to reduce parasitic energy consumption while improving long-term reliability.

4. Thermal Energy Storage

Captured thermal energy is stored within the system to extend useful operating time into evening hours and periods of intermittent cloud cover.

Storage capability is intended to reduce dependence on diesel-powered refrigeration during periods when solar energy is unavailable.

5. Refrigeration Integration

The retrofit does not replace the existing refrigeration unit.

Instead, thermal energy is introduced to reduce the refrigeration system's compressor workload while allowing fleets to continue operating equipment they already own and maintain.

6. Optional Power Generation

Recovered thermal energy may also be directed into an Organic Rankine Cycle (ORC) or Stirling engine to generate electrical power for:

- Refrigeration controls
- Interior lighting
- Sensors
- Monitoring equipment
- Auxiliary electrical loads

This additional capability is intended to further reduce diesel engine runtime by supplying electrical loads that would otherwise require battery charging or continued engine operation.

Integrated Technology Platform

The system combines multiple engineering disciplines into a single integrated solar thermal platform, including:

- Solar thermal collection
- Optical concentration
- Spectrally selective absorber coatings
- Advanced heat transfer
- Passive thermosiphon circulation
- Thermal energy storage
- High-efficiency heat exchangers
- Organic Rankine Cycle power generation

While many of these engineering principles are individually well understood within the thermal engineering industry, the patent-pending innovation lies in their integration into a unified commercial platform optimized for refrigerated transportation.

Engineering Philosophy

The objective of the Solar-Assist Refrigeration Retrofit is not to replace existing refrigeration technology but to improve its operating efficiency.

By harvesting renewable thermal energy that would otherwise be unavailable to the refrigeration process, the system is designed to reduce diesel fuel consumption, lower operating costs, reduce emissions, and improve overall fleet economics while requiring minimal changes to existing fleet operations.

Technical Summary

The Solar-Assist Refrigeration Retrofit integrates proprietary thermal collection, heat transfer, passive circulation, thermal storage, and optional electrical generation into a single patent-pending platform intended to improve the efficiency of diesel-powered refrigerated transportation.

The detailed engineering basis for this integrated approach is presented in **Appendix B — The Twenty-One Integrated Engineering Mechanisms**, which provides a more comprehensive description of the scientific principles supporting the system architecture.

APPENDIX B

Page 1

INTEGRATED ENGINEERING PRINCIPLES

The Twenty-One Scientific Mechanisms Behind the MacSunPod™ Platform

Engineering Overview

The MacSunPod™ Solar-Assist Platform is founded upon twenty-one established scientific and engineering principles that work together as one integrated thermal energy system.

Although each principle is individually recognized within the fields of thermodynamics, fluid mechanics, optics, heat transfer, and power generation, the patent-pending innovation lies in their integration into a single commercial platform optimized for solar thermal energy capture and utilization.

Unlike conventional solar systems that rely primarily on photovoltaic electricity generation, the MacSunPod™ platform is designed to maximize the direct collection, transport, storage, and productive use of thermal energy.

This systems-based approach enables multiple stages of energy recovery before heat is ultimately rejected to the environment, allowing significantly greater utilization of the available solar resource.

Engineering Categories

The twenty-one mechanisms are organized into three engineering disciplines.

I. Solar Energy Collection

Capturing the maximum amount of solar energy while minimizing losses.

Mechanisms 1–8

II. Thermal Transport & Energy Storage

Moving, retaining, and managing thermal energy throughout the system.

Mechanisms 9–15

III. Energy Recovery & Power Generation

Converting captured thermal energy into useful work and electricity.

Mechanisms 16–21

Integrated System Philosophy

Rather than relying upon a single technological breakthrough, the MacSunPod™ platform derives its performance from the coordinated interaction of multiple engineering principles operating simultaneously.

This integrated systems architecture forms the basis of the Company's patent-pending technology.

APPENDIX B

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SOLAR ENERGY COLLECTION

Mechanisms 1–8

The first stage of the MacSunPod™ platform is dedicated to maximizing the capture and retention of solar energy. Rather than relying on a single absorber, the collector integrates multiple optical and thermal engineering principles that work together to convert incoming sunlight into usable heat while minimizing losses.

Mechanism 1 — Direct Solar Radiation

The collector is oriented to intercept the maximum practical amount of incident solar radiation throughout the operating day. This incoming solar energy serves as the primary thermal input to the system.

Mechanism 2 — Greenhouse Effect

High-transmission glazing allows short-wave solar radiation to enter while reducing the escape of long-wave infrared radiation. This greenhouse effect increases the collector's internal operating temperature and improves thermal efficiency.

Mechanism 3 — Optical Concentration

The collector incorporates Fresnel lenses, compound parabolic concentrators (CPCs), or other optical elements that concentrate solar radiation onto the absorber surface, increasing thermal energy density.

Mechanism 4 — Selective Absorber Coatings

The absorber utilizes spectrally selective coatings engineered to maximize solar absorption while minimizing infrared emission losses.

Mechanism 5 — Convective Heat Loss Reduction

Collector geometry, insulation, and enclosed air spaces reduce convective heat losses caused by wind and ambient airflow.

Mechanism 6 — StarFlow™ Passive Circulation

Thermosiphon circulation naturally moves heated BlueNanofluid™ through the collector without requiring continuously operating mechanical pumps.

Mechanism 7 — Radiative Heat Loss Reduction

Low-emissivity materials reduce infrared radiation leaving the collector, preserving thermal energy for downstream use.

Mechanism 8 — BlueNanofluid™ Heat Transfer Enhancement

BlueNanofluid™ rapidly absorbs heat from the collector and transports it throughout the system with improved thermal conductivity and heat retention characteristics.

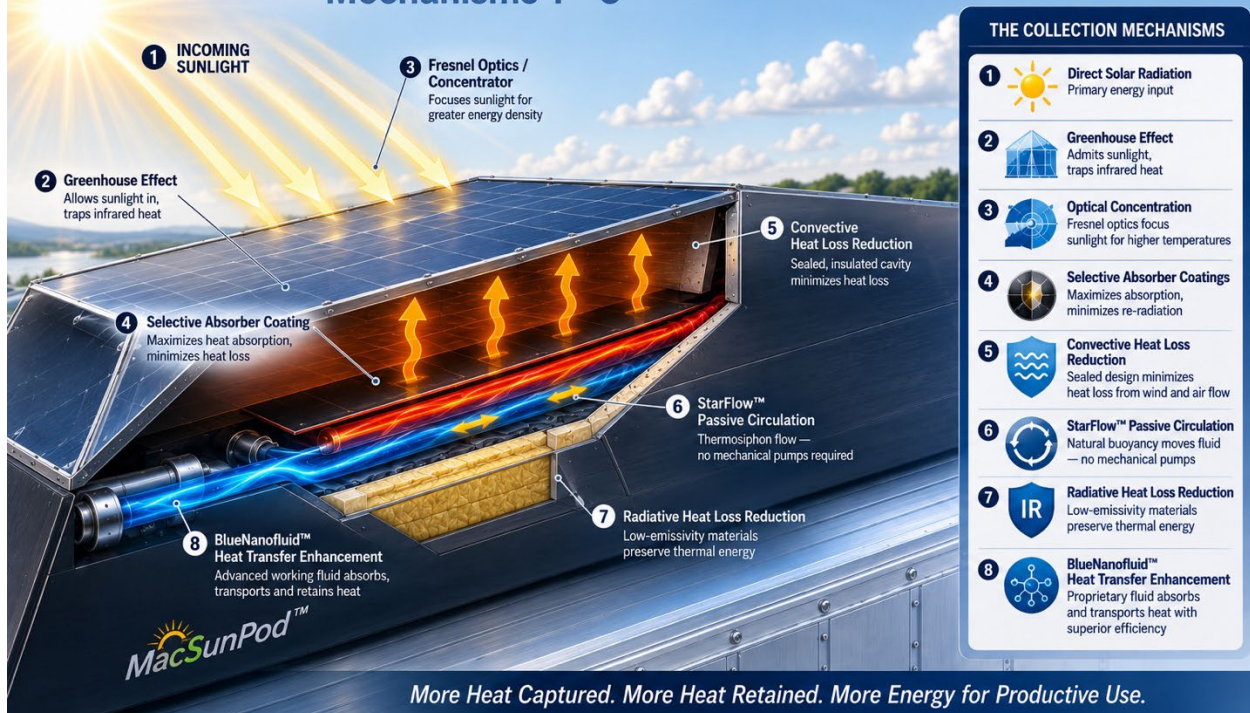
Engineering Objective

Capture the greatest possible amount of usable thermal energy while minimizing optical, convective, and radiative losses.

SOLAR ENERGY COLLECTION

Mechanisms 1 – 8

Maximizing the capture and retention of solar energy while minimizing losses.



APPENDIX B

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THERMAL TRANSPORT & ENERGY STORAGE

Mechanisms 9–15

Once solar energy has been captured, the platform focuses on transporting, storing, and managing that energy as efficiently as possible.

Mechanism 9 — Stack Effect

Natural buoyancy forces assist circulation through the system.

Mechanism 10 — Bernoulli / Venturi Flow

Optimized fluid pathways improve circulation characteristics and heat exchange.

Mechanism 11 — Conductive Heat Transfer

Thermal energy moves efficiently from absorber surfaces into the circulating BlueNanofluid™.

Mechanism 12 — Latent Heat Transfer

Phase-change processes transfer large quantities of thermal energy with minimal temperature variation.

Mechanism 13 — Sensible Heat Storage

Thermal mass stores captured solar energy for use during evening hours and periods of reduced sunlight.

Mechanism 14 — Thermal Stratification

Natural layering preserves higher-temperature fluid while minimizing unwanted mixing.

Mechanism 15 — Optimized Specific Heat Capacity

The working fluid is engineered to transport and retain large quantities of thermal energy efficiently.

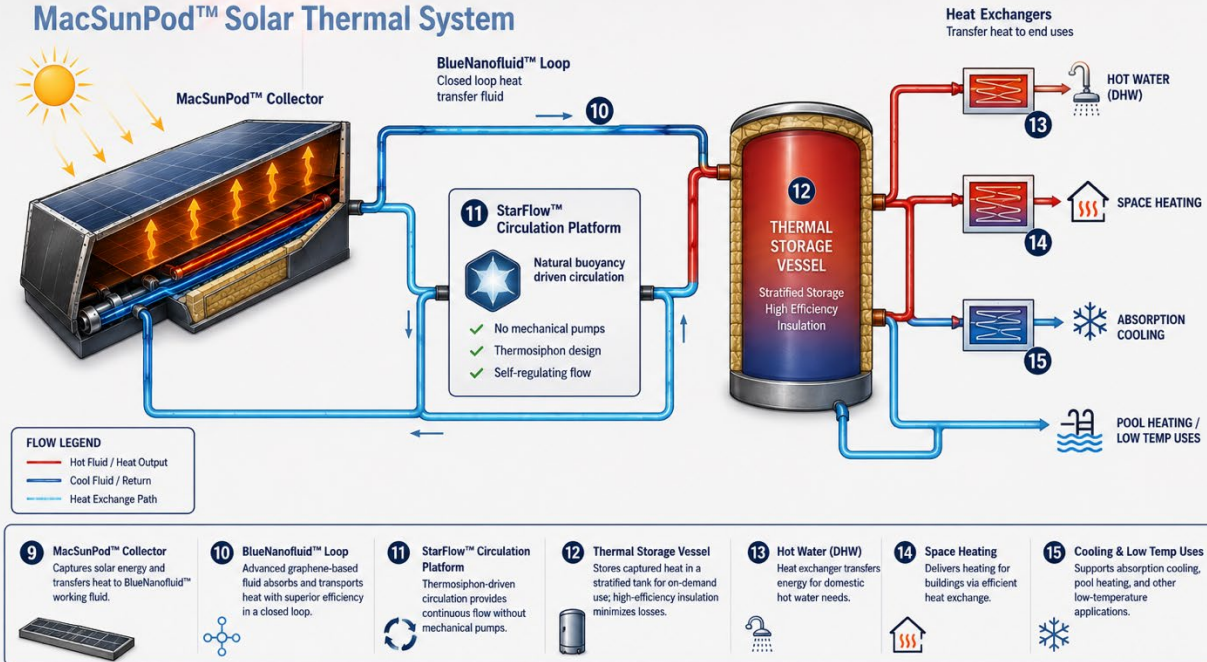
Engineering Objective

Move, preserve, and store captured thermal energy with the highest practical efficiency while minimizing energy losses.

APPENDIX – Integrated Engineering Principles

SYSTEM INTEGRATION SCHEMATIC

MacSunPod™ Solar Thermal System



Integrated. Efficient. Reliable. Engineered for Maximum Heat Capture and Retention.

APPENDIX B

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ENERGY RECOVERY & POWER GENERATION

Mechanisms 16–21

After thermal energy has been collected and stored, the final stage of the platform focuses on extracting the maximum possible value from that energy before it is ultimately rejected.

Mechanism 16 — Organic Rankine Cycle (ORC)

Moderate-temperature thermal energy drives an organic working fluid suitable for electrical generation.

Mechanism 17 — Isentropic Expansion

Expanding vapor converts thermal energy into mechanical shaft power.

Mechanism 18 — Electrical Generation

Mechanical rotation is converted into electrical power through an integrated generator.

Mechanism 19 — Heat Recovery

Residual thermal energy remaining after electrical generation is recovered for additional useful work.

Mechanism 20 — Combined Heat & Power (CHP)

Thermal and electrical energy are produced simultaneously from the same solar energy source.

Mechanism 21 — Cascaded Energy Utilization

Thermal energy is applied sequentially to multiple applications before final rejection, maximizing overall system efficiency.

APPENDIX B

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INTEGRATED SYSTEM ARCHITECTURE

Twenty-One Engineering Principles Working as One Platform

The MacSunPod™ platform is designed as a systems-level engineering solution. Rather than relying upon any single technological breakthrough, overall performance results from the coordinated interaction of twenty-one complementary scientific principles.

Each subsystem enhances the performance of the next:

Solar Collection captures incoming energy.

↓

BlueNanofluid™ rapidly absorbs and transports thermal energy.

↓

StarFlow™ Passive Circulation distributes heat without continuous mechanical pumping.

↓

Thermal Storage extends system operation beyond daylight hours.

↓

Energy Recovery Systems convert stored thermal energy into useful heating and electrical power.

↓

Existing Refrigeration Equipment benefits from reduced compressor workload and lower diesel consumption.

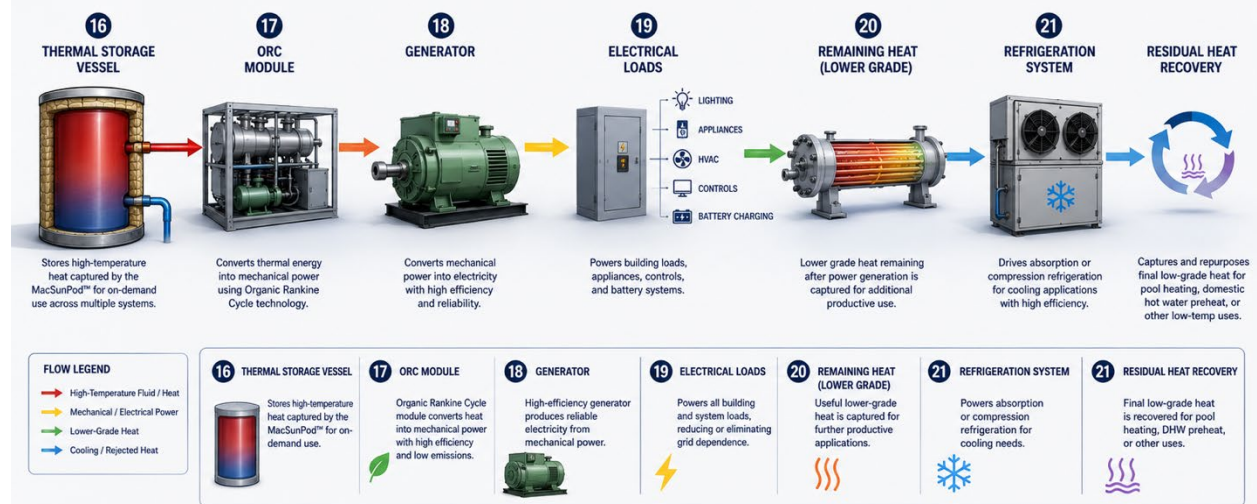
Engineering Objective

Extract the greatest practical amount of useful work from every unit of captured solar energy.

APPENDIX – Integrated Engineering Principles

ENERGY CASCADE – MAXIMIZING USEFUL WORK AND HEAT

From Captured Heat to Maximum Energy Output



Maximum Energy. Zero Waste. Multi-Use by Design.

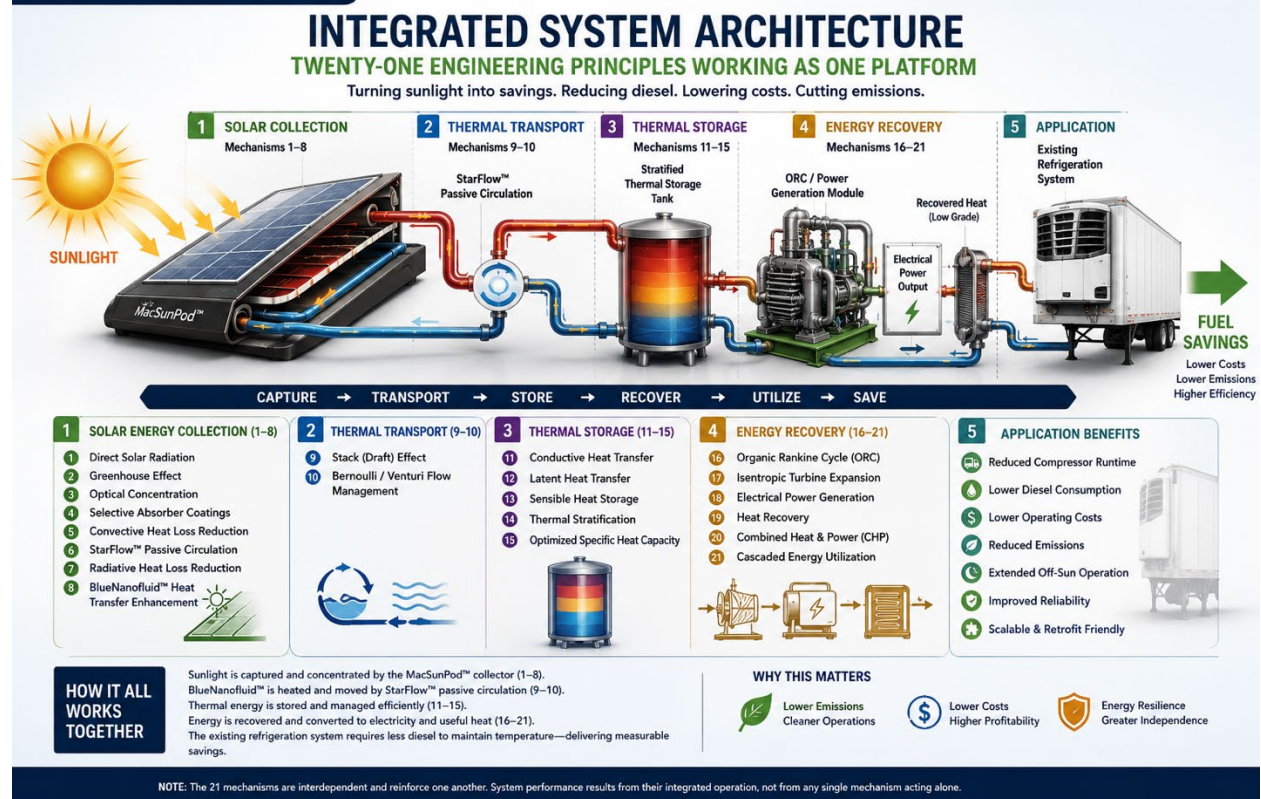
Thermal Storage → ORC Module → Generator → Electrical Loads → Remaining Heat → Refrigeration System → Residual Heat Recovery

Systems Engineering Philosophy

The MacSunPod™ platform reflects a systems-engineering approach in which optics, thermal science, fluid dynamics, heat transfer, energy storage, and power generation operate as a unified architecture rather than as independent technologies.

This integration is the basis of the patent-pending platform and provides the foundation for future applications across refrigerated transportation, industrial thermal systems, renewable energy, water treatment, and other commercial markets.

APPENDIX B – THE 21 SCIENTIFIC MECHANISMS



INTEGRATED ENGINEERING PRINCIPLES

THE TWENTY-ONE SCIENTIFIC MECHANISMS BEHIND THE MacSunPod™ PLATFORM

ENGINEERING OVERVIEW

The MacSunPod™ Solar-Assist Platform is founded upon twenty-one established scientific and engineering principles that work together as one integrated thermal energy system.

Although each principle is individually recognized within the fields of thermodynamics, fluid mechanics, optics, heat transfer, and power generation, the patent-pending innovation lies in their integration into a single commercial platform optimized for solar thermal energy capture and utilization.

Unlike conventional solar systems that rely primarily on photovoltaic electricity generation, the MacSunPod™ platform is designed to maximize the direct collection, transport, storage, and productive use of thermal energy.

This systems-based approach enables multiple stages of energy recovery before heat is ultimately rejected to the environment, allowing significantly greater utilization of the available solar resource.

ENGINEERING CATEGORIES



I. SOLAR ENERGY COLLECTION

Capturing the maximum amount of solar energy while minimizing losses.

MECHANISMS 1–8



II. THERMAL TRANSPORT & ENERGY STORAGE

Moving, retaining, and managing thermal energy throughout the system.

MECHANISMS 9–15



III. ENERGY RECOVERY & POWER GENERATION

Converting captured thermal energy into useful work and electricity.

MECHANISMS 16–21

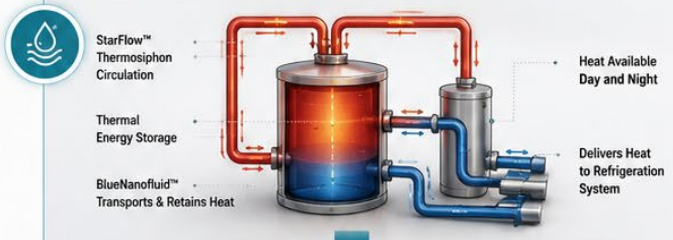
INTEGRATED SYSTEM PHILOSOPHY

Rather than relying upon a single technological breakthrough, the MacSunPod™ platform derives its performance from the coordinated interaction of multiple engineering principles operating simultaneously. This integrated systems architecture forms the basis of the Company's patent-pending technology.

1 SOLAR ENERGY COLLECTION (1–8)



2 THERMAL TRANSPORT & STORAGE (9–15)



3 ENERGY RECOVERY & POWER GENERATION (16–21)



REDUCED DIESEL CONSUMPTION
LOWER COSTS | LOWER EMISSIONS



The MacSunPod™ platform integrates optics, advanced heat transfer, passive circulation, thermal storage, and energy recovery into one unified system—maximizing the value of every ray of sunlight.