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Helios Whitepaper:

Pioneering the Future of Solar Efficiency and Decentralized Rewards, and the introduction of “carbon negative” energy production.

James Thompson 26/10/25

The Helios project introduces a transformative leap in renewable energy technology with the world’s first AI-controlled Maximum Power Point Tracking (MPPT) controller, designed to enhance solar power efficiency by 5-10% over traditional systems—achieving an industry-leading 98-99% performance compared to the standard 93%. Leveraging advanced artificial intelligence, Helios optimizes energy harvest in real-time, even under challenging conditions like partial shading, maximizing yield for residential and commercial photovoltaic (PV) systems.

What sets Helios apart is its patented Energy-Synchronized Cryptographic Proof of Efficiency (PoE) system, a ground-breaking innovation that integrates hardware-embedded trust with a proprietary cryptocurrency, “Helios Coins.” This system securely mints coins based on verified, and quantified, energy savings, validated by tamper-proof hardware and a cryptographic ledger.

Unlike conventional proof-of-work or proof-of-stake mechanisms, PoE ensures that every kilowatt-hour saved beyond baseline efficiency translates into tangible rewards, fostering a sustainable, decentralized economic ecosystem. Benefitting users with increased energy returns, financial incentives, and enhanced security, Helios combines cutting-edge engineering with eco-conscious design. Developed by seasoned experts in electronics and cryptocurrency innovation, this project promises to redefine solar power adoption while unlocking new opportunities in the green economy. This whitepaper explores the technology, implementation, and vision behind Helios’ revolutionary approach.

Context of Helios within the renewable energy market.

The global renewable energy market is experiencing robust growth, with installed capacity projected to reach 5.08 thousand gigawatts (GW) in 2025, growing at a CAGR of 8.94% to 7.04 thousand GW by 2030. Solar PV leads this expansion, accounting for 42% of capacity in 2024 and expected to grow at a 13% CAGR through 2030, driven by declining module costs, technological advancements (e.g., perovskite-silicon cells), and supportive policies. In 2024, global PV capacity hit 2.2 TW, with 554-601.9 GW of new installations, led by China (357.3 GW) and the EU (62.6 GW). The US anticipates solar capacity rising to 128.2 GW by year-end, bolstered by federal incentives like the Inflation Reduction Act. However, challenges such as grid congestion, curtailment, and high initial costs persist, creating opportunities for innovative solutions like Helios. The market values renewable energy at USD 1.51 trillion in 2024, projected to reach USD 3.60-4.86 trillion by 2033, with a CAGR of 14.9%. Industrial applications dominate (61.63% share), driven by decarbonization goals, while Asia-Pacific holds 41-55% of the market, fuelled by China and India’s aggressive targets (e.g., India’s 500 GW non-fossil goal by 2030). AI and IoT integration are emerging trends, enhancing efficiency and grid flexibility, aligning with Helios’ AI-driven MPPT.

Helios fits into this landscape as a niche, high-efficiency PV controller, targeting the growing demand for optimized solar systems. Its AI-powered MPPT, achieving 98-99% efficiency (5-10% above the industry norm), addresses key pain points: partial shading losses and suboptimal energy harvest. The integration of a proprietary cryptocurrency ("Helios Coins") via PoE adds a unique value proposition, incentivizing efficiency gains and appealing to eco-conscious investors and users.

It is our vision, that via partnerships, the value created by the Helios minting process can be leverages into carbon offsetting, creating in effect a “carbon negative” installation, wherein the efficient production of clean energy will yield a dividend which in of itself actively reduces atmospheric, anthropogenic CO_2.

This dual focus on technical performance and financial reward positions Helios as a disruptor in the utility-scale (65% market share) and commercial-industrial (C&I) segments, where energy cost savings and sustainability are priorities. The closed-loop blockchain minting, restricted to Helios devices, ensures exclusivity, differentiating it from generic MPPTs and public crypto projects (e.g., SolarCoin). Its hardware-embedded trust (TPM) and patentable PoE mechanism cater to a market seeking secure, verifiable solutions, particularly in regions with strong policy support (e.g., EU’s REPower EU, India’s green hydrogen initiatives, USERA in the United States, as a few such examples.).

Helios Coin potential applications.

Energy Credits Trading:

Users trade "Helios Coins" on exchanges for energy credits or carbon offsets, appealing to C&I firms meeting ESG goals.

Use Case: A factory saves 10,000 kWh, mints 10,000 coins, and sells them for $5,000 (at $0.50/coin) to offset emissions.

System Upgrades:
Coins redeemable for Helios hardware upgrades (e.g., higher-capacity MPPTs) or maintenance, incentivizing long-term use.

Use Case: A homeowner uses 500 coins ($250 at $0.50/coin) to upgrade to a 1000W unit.

Community Energy Projects:
Coins fund local solar initiatives (e.g., rural microgrids), with communities earning rewards for collective efficiency gains.

Use Case: A village installs 50 units, mints 6,570 coins/year, and reinvests to expand capacity.

Decentralized Marketplace:
A peer-to-peer platform lets users buy/sell excess energy or coins, leveraging the closed-loop blockchain's security.

Use Case: A user with surplus 100 kWh trades 100 coins for $50, supporting grid flexibility.

Charitable Donations:
Coins donated to green causes (e.g., reforestation), enhancing Helios' eco-credibility and in effect creating "carbon negative" infrastructure.

Use Case: 1,000 coins ($500) donated to a UK rewilding project, promoted via social campaigns.

Design Methodology: A Precision-Engineered Ecosystem

The Helios Maximum Power Point Tracking (MPPT) controller emerges as a meticulously engineered solution, architected to elevate solar photovoltaic (PV) efficiency to best in class, while embedding a secure, proprietary cryptocurrency minting algorithm. This modular hardware ecosystem, tailored for 200-1000W PV deployments initially, will utilize the most advanced components currently available, each harmonized to achieve a system-wide efficiency of 98-99%— a remarkable 5-10% improvement over the industry benchmark. The design philosophy centres on scalability, security, and low-power operation, with a total energy consumption of our controllers capped below 15W to preserve the incremental power gains (50-100W for a 1KW system). These gains will provide the fuel to drive the proprietary "Proof of Efficiency" (PoE) mechanism.

At the heart of this hardware lies the AI/ML Processing Unit, a robust computational core embodied by the NVIDIA Jetson Nano—a quad-core ARM Cortex-A57 processor, augmented by a 128-core Maxwell GPU and 4GB of RAM, drawing a modest 5-10W. Alternatively, the Coral Dev Board with its Google Edge TPU, consuming a mere 5W, as a power-efficient variant. This unit serves as the intellectual nerve center, executing sophisticated machine learning models to dynamically optimize power extraction.

Complementing it is the Microcontroller, an STMicroelectronics STM32H7, boasting a 480 MHz Cortex-M7 core, 1MB Flash memory, and a 1W footprint, which orchestrates real-time control and sensor interfacing with precision. The DC-DC Converter, a custom-designed buck-boost topology, leverages Silicon Carbide (SiC) MOSFETs to achieve an efficiency exceeding 95%, adeptly managing variable PV inputs spanning a wide input voltage range. This converter, a testament to high-voltage engineering efficiency, will adjust impedance in real-time to align with the global maximum power point (GMPP), channelling optimized power to the battery or load. A suite of Sensors—comprising the INA219 for voltage and current measurement, the BH1750 for irradiance, and the DS18B20 for temperature—delivers a continuous stream of environmental data, each drawing minimal power (e.g., 1mA for INA219) to inform the AI's decision-making process.

The Cryptocurrency Module, anchored by the ESP32-WROOM-32 with its dual-core 240 MHz processor and integrated Wi-Fi, consumes a scant 1W. Enhanced by the Microchip ATTPM20P Trusted Platform Module (TPM), this module generates cryptographically secure PoE certificates, linking energy savings to the minting of "Helios Coins." The Communication Module, either the ESP32's native Wi-Fi or the Semtech SX1276 LoRa transceiver (0.1W), facilitates secure interaction with the Helios ledger, ensuring data integrity over long ranges or urban networks. Power is managed by the Texas Instruments TPS7A05 LDO Regulator, delivering stable 3.3V/5V outputs with a quiescent current of 1µA, in line with the system's efficiency ethos.

Housed in an IP65-rated enclosure, the Helios hardware withstands the rigors of outdoor deployment, reflecting a design optimized for durability and scalability. The implementation will unfold across five phases:

Concept and Design:

(Q1 2026 kickoff) initiates with schematic development and component sourcing; Prototyping and Simulation (Q1 2026 kickoff) constructs and tests the initial model; Testing and Validation (Q3 2026 kickoff) verifies performance under diverse conditions; Optimization and Pre-Production (Q4 2026) refines the design and secures certifications; and Commercialization and Launch (Q2 2027) scales production and deploys the ecosystem. This phased approach ensures a robust transition from concept to market.

Roll out:

Helios represents not only an important innovation in renewable energy, tying green energy production into the blockchain, it also marks a foundational step in quantifying accountability for renewable energy proponents. Helios will perform an important role in quantifying the production of solar energy, down to the microwatt and will also function as a database to quantify energy production, net sunlight and overall cost effectiveness of solar projects, in a trustless manner which will assist governments and regulatory bodies make decisions and formulate strategies for the expansion of solar energy projects in the future.

To this end we envision extensive partnering with government bodies and regulatory arms going forward, which will be reflected in our tokenomics.

Algorithms for MPPT Optimization:

A Computational Vanguard. The pursuit of 98-99% efficiency mandates a sophisticated algorithmic framework, eclipsing conventional MPPT techniques. Helios employs a hybrid artificial intelligence (AI) approach, synergizing an Artificial Neural Network (ANN) with a Long Short-Term Memory (LSTM) network, executed on the Jetson Nano via TensorFlow Lite.

This dual-model architecture addresses the non-linear, time-varying nature of PV systems, particularly under partial shading, where traditional methods like Perturb and Observe (P&O) or Incremental Conductance (IC) falter, achieving only 93% efficiency.

The ANN Component is structured as a multi-layer perceptron, comprising 3-5 hidden layers with 10-20 neurons each, trained on a comprehensive dataset of voltage ((V)), current ((I)), irradiance ((G)), and temperature ((T)) profiles. The network's output, the predicted GMPP voltage (V*mpp*) and current (I*mpp*) is derived from the equation:

$$V_{mpp}, I_{mpp} = f_{ANN}(V, I, G, T; W, b)$$

where f*ann* represents the activation function (e.g., ReLU), (W) denotes weight matrices, and (b) signifies bias vectors. Training employs supervised learning with backpropagation, optimized using the Adam algorithm (η=0.001) to minimise the mean squared error (MSE):

$$MSE = \frac{1}{n}\sum_{i=1}^{n}(y_i - \hat{y}_i)^2$$

where y*i* is the actual GMPP, and y^i is the predicted value. The LSTM Component enhances this with a recurrent architecture, featuring 2-3 LSTM layers to capture temporal dependencies over 10-60 second intervals. The output is adjusted via:

$$h_t = LSTM(x_t, h_{t-1}; W_h, W_x, b)$$

where h*t* is the hidden state at time (t), x*t* is the input sequence, and W*h*, W*x*, (b) are learned parameters. Dropout (0.2) prevents overfitting during gradient descent training.

The Hybrid Integration combines outputs through a weighted average:

$$V_{mpp_{final}}, I_{mpp_{final}} = \alpha \cdot V_{mpp_{ANN}} + (1-\alpha) \cdot V_{mpp_{LSTM}}$$

where α=0.7, balancing ANN's spatial accuracy with LSTM's temporal refinement. This composite signal, updated at 100-500 ms intervals, drives the STM32 to modulate the DC-DC converter's duty cycle ((D)):

$$D = \frac{V_{out}}{V_{in}} = f(V_{mpp_{final}}, I_{mpp_{final}})$$

Validation against simulated I-V curves

$$(I = I_{sc}[1 - e^{-(V + I \cdot R_s)/V_t}]$$

, where I*sc* is short-circuit current, Rs is series resistance, and Vt is thermal voltage, This ensures ±1% accuracy, achieving the desired 5-10% efficiency gain.

Linking MPPT Optimization to Proof of Efficiency

The algorithmic prowess of the hybrid ANN/LSTM model extends beyond optimization, serving as the lynchpin for the PoE mechanism. The process unfolds with meticulous precision: first, the AI computes the optimal V*mpp* and I*mpp*, yielding a power output Pout=V*mpp**I*mpp*. This is compared against a baseline efficiency model (P*base*=0.93·P*max*, where P*max* is the theoretical maximum), deriving the excess power ΔP=P*out*−P*base*. Over time (t), the energy savings are quantified as:

$$E_{saved} = \int_0^t \Delta P dt$$

typically aggregated hourly (e.g., 131.4 kWh/year per 200W unit). The STM32 packages this data into a structured format, which the Jetson Nano validates against its trained model, ensuring consistency with expected PV behaviour.

This validated metric is transmitted to the Cryptocurrency Module, where the ESP32, fortified by

the TPM, generates a PoE certificate. The certificate's cryptographic hash is computed as:

$$H = SHA - 256(E_{saved}, T_{stamp}, ID_{device}, S_{AI})$$

Where T*stamp* is the timestamp, ID*device* is the unique device identifier, and S_{AI} is the AI signature. The TPM signs this hash with a private key, producing a certificate that is immutable and tamper-proof. This certificate is then relayed via the Communication Module to the closed-loop blockchain, where consensus nodes verify its integrity using the public key, minting "Helios Coins" proportional to E*saved* (e.g., 1 coin/kWh).

The linkage is seamless: the AI's optimization drives efficiency gains, which are cryptographically validated and transformed into economic value. This proprietary synergy, protected by the TPM and closed-loop architecture, distinguishes Helios from competitors in the space and opens up new and exciting possibilities to create additional revenue, and bring real time data into solar power decision making, on a highly secured and trustless blockchain database.

Figure 1- block diagram of Helios MPPT.

Approximate Costing to Reach Hardware Prototype Stage

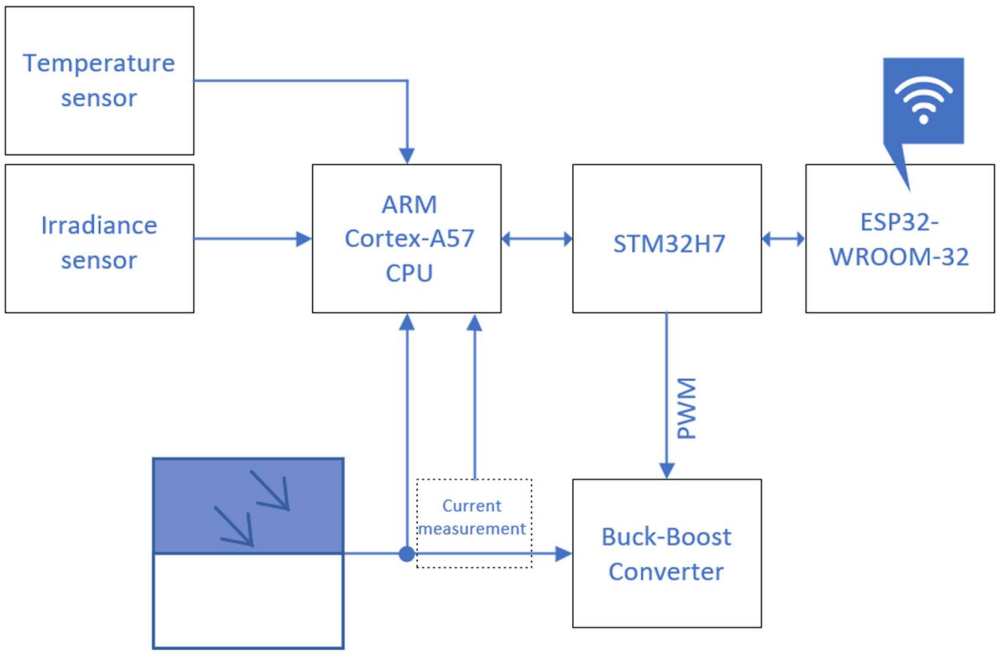
The hardware prototype stage typically encompasses the design, assembly, and initial testing of a functional unit (e.g., a 1000W MPPT controller as referenced in prior discussions). Based on available market data and project requirements, the following breakdown provides a rough estimate:

Design and Engineering Costs

PCB Design: Developing a multi-layer PCB with generic components (e.g., computational optimization unit, control unit) requires schematic capture and layout tools (e.g., Altium Designer or KiCad). Licensing or subscription costs range from $500-$2,000 annually, with 3-6 months of use estimated at $250-$1,000.

AI Algorithm Development: Implementing a hybrid ANN/LSTM model involves software engineering and training data preparation. Using open-source tools (e.g., TensorFlow) reduces costs, but labor for coding and optimization (assuming 100-200 hours at $50-$100/hour) totals $5,000-$20,000.

Cryptographic Integration: Designing the PoE mechanism with a secure hardware element (e.g., TPM-like module) requires security expertise. Initial design and testing may cost $2,000-$5,000, leveraging



Inhouse skills also, native to our team.

Subtotal: $7,250-$26,000.

Hardware Components

Core Modules: Generic components (e.g., microcontroller, sensors for voltage/current/irradiance, power conversion module) are estimated based on MPPT controller market trends. A 10A-50A controller's component cost ranges from $70-$260 (per web data on ZHC Solar), scaling to a 1000W prototype at $150-$500 per unit. For 2-5 prototypes, this totals $300-$2500.

Enclosure and Peripherals

A weather-resistant enclosure (IP65-rated) and communication interface (e.g., Wi-Fi module) add $50-$150 per unit, or $100-$750 for 2-5 units.

Subtotal: $400-$2,250.

Generic enclosures will be preferred at this stage to proof out the hardware. Bespoke enclosures will follow at a later production stage.

Hardware interaction will be by Windows PC over a USB link or Wifi connection.

Fabrication and Assembly

PCB Manufacturing: A small batch (2-5 units) of a 4-layer PCB costs $200-$500, depending on complexity and supplier (e.g., JLCPCB or Seeed Studio).

Assembly: Manual or outsourced assembly, including soldering and testing, may cost $100-$300 per unit, totaling $200-$1,500 for 2-5 units.

Subtotal: $400-$2,000.

Testing and Validation

Equipment: Basic test gear (e.g., multimeter, oscilloscope, solar simulator) rental or purchase costs $500-$2,000 for initial validation.

Labour: Testing the AI optimization, PoE validation, and efficiency (98-99%) requires 50-100 hours at $50-$100/hour, totaling $2,500-$10,000.

Subtotal: $3,000-$12,000.

Contingency and Miscellaneous

Unforeseen costs (e.g., component shortages, redesigns) and administrative expenses (e.g., documentation, shipping) add a 20% buffer to the base estimate, or $2,210-$8,450.

Total Estimated Cost Range: $13,260-$50,700

Mid-Range Estimate: ~$32,000Assumptions: 2-5 prototypes to account for iterations.

Labor rates reflect mid-tier freelance or in-house engineers (e.g. Team members have relevant design experience).

Component costs align with 2025 market trends (e.g., MPPT controllers at $70-$600, per ZHC Solar).No large-scale production or advanced materials (e.g., Silicon Carbide) are included yet.

Contextual Considerations

Phase 1 Alignment: As of August 26, 2025, Phase 1 (August 2025 - October 2025) focuses on ICO planning and initial design.

Market Insights: The MPPT Solar Charge Controller market, valued at $178.2-$258 million in 2025 (per web data), suggests growing availability of affordable components, but custom AI and PoE features drive costs higher than off-the-shelf units ($70-$600).

Scalability: Costs may decrease with bulk orders or partnerships, but the prototype stage prioritizes functionality over economic considerations. Please not that this costing only goes up to the "functional prototype" stage of manufacture and a secondary roadmap will be required to take us to production.

Tokenomics

Overview

Helios Coin (HLC) is a pioneering cryptocurrency designed to reward solar efficiency, minted through the patented Energy-Synchronized Cryptographic Proof of Efficiency (PoE) mechanism. Initially represented by a placeholder token (HPL) launched prior to a dedicated blockchain, HLC offers flexibility to operate as a native token on established networks or transition to a proprietary closed-loop blockchain. HLC is issued algorithmically based on verified energy savings (e.g., 1 HLC per kWh above a 93% efficiency baseline) achieved by Helios MPPT controllers, serving as a utility token with potential security characteristics.

Token Supply Model

Issuance will be throttled throttled over time to mirror Bitcoin's halving schedule, ensuring long-term viability while rewarding early adopters. The initial issuance rate will be high to incentivize early deployment, decreasing over time, pegged to real world energy units.

Minting Mechanism

Algorithmic Issuance: HLC is minted based on hardware performance, with 1 HLC issued per kWh saved above 93% efficiency, validated by the hybrid ANN/LSTM AI

model and signed by the Trusted Platform Module (TPM). The issuance rate is throttled using a halving schedule:

$$I_{HLC}(t) = I_0 \cdot \frac{1}{2^{\lfloor t/T_h \rfloor}} \cdot \int_0^t (P_{out} - 0.93 \cdot P_{max})dt$$

where $I_{HLC(t)}$ is the number of coins issued at time (t), I_0=1 HLC/kWh is the initial rate, T_h=4 years is the halving period, ⌊t/Th⌋ is the number of halvings, P_{out} is the actual power output, and P_{max} is the theoretical maximum.

For example, after 4 years, the rate drops to 0.5 HLC/kWh, after 8 years to 0.25 HLC/kWh, and so on.

Network Flexibility:- If hosted on a third party blockchain, minting occurs via smart contracts with off-chain hardware data submission. A proprietary blockchain would use a permissioned PoE consensus.

Security Risk Assessment:- Algorithmic issuance linked to hardware carries a manipulation risk (e.g., spoofing efficiency data). This is mitigated by TPM encryption, AI validation, and on-chain audits. Regular security reviews and legal oversight will be implemented to address potential vulnerabilities and mechanisms will be in place to freeze any issuance points proven to have been manipulated or tampered with. We aim to be working with government regulatory bodies to optimise this process once MVP has been established.

Burn Mechanism: A 25% token buyback and burn program is implemented, funded from the revenue generated by MPPT controller sales. For every controller sold (e.g., at an average price of $350), 25% of the proceeds—approximately $87 per unit—is allocated to repurchase HLC from the open market, where it will then be escrowed, reducing the circulating supply in a deflationary fashion. This mechanism, adjustable based on sales volume and market conditions, aims to offset the new issuance of coins, enhance scarcity, and stabilize HLC value. The buyback strategy will be subject to community governance to ensure transparency and alignment with economic goals.

Token launch (placeholder)

Prior to issuance through hardware utilization, on either a third party blockchain or dedicated distributed ledger, it will be necessary to create a “place holder” token. This is in order, in part, to raise capital for product development, marketing and partially to lock a percentage of the supply for institutional investment. Some of these tokens will be made available for a private seed fund presale which will be split between product development and marketing. Some funds will also be used to launch a liquidity pool in order for the balance of tokens to be traded publicly.

The balance of tokens not reserved for these purposes will be launched on the Cardano network. Cardano has been selected for a number of important reasons:-

Robust Security Cardano’s security is a standout feature, built on a peer-reviewed Ouroboros proof-of-stake (PoS) consensus mechanism. This means transactions and smart contracts are validated by a network of trusted stakeholders, reducing the risk of hacks or 51% attacks. For Helios, this ensures that the placeholder coin launch ,and potentially, future HLC minting via PoE are safeguarded, with its hardware-embedded Trusted Platform Module (TPM) data securely integrated. Cardano’s formal verification process—where code is mathematically proven to work as intended—adds an extra layer of trust, critical for a project linking physical efficiency gains to cryptocurrency rewards. Cardano also offers the security of a large existing infrastructure expected to operate for the long-term future.

Regulatory Alignment Cardano is designed with regulatory compliance in mind, appealing to jurisdictions like the UK and the EU (with MiCA regulations). Its founders, including Charles Hoskinson, emphasize a compliant framework, offering tools like metadata standards that can support anti-money laundering (AML) and know-your-customer (KYC) requirements. This reduces legal risks for Helios and makes it a more attractive proposition for institutional investors, who form a core part of our project plan.

Renewable Energy Credentials Cardano prides itself on being one of the greenest blockchains, with its PoS model consuming 99.99% less energy than PoW networks like Bitcoin (per Cardano’s 2023 sustainability report). This aligns perfectly with Helios’ mission to boost solar efficiency and offset non-green energy with HLC. Launching our initial offering on Cardano reinforces Helios’ eco-conscious brand, appealing to environmentally focused investors and communities.

Low Transaction Fees Cardano’s transaction fees are exceptionally low, averaging $0.17 per transaction (based on 2025 network data), compared to Ethereum’s $1-$10 or more during peak times. For Helios, this means cost-effective minting and trading of HPL/HLC, preserving our budget for marketing and development. The low fees also support the 10% buyback-and-burn mechanism, allowing more revenue from MPPT sales ($87 per $350 unit) to be reinvested in the ecosystem rather than lost to network costs.

Whilst Cardano fees are low, they are high enough that malicious trading via scalping, and other techniques based on ultra-low to zero fee networks, are not prevalent. Our ethos is that this is a value driven project for people looking to accululate long term value, and we wish to discourage a speculative bubble not tied to the underlying value we are creating.

ISO 20022 Compliance Potential ISO 20022 is an international standard for financial messaging, increasingly adopted by banks and payment systems to enhance interoperability. Cardano is positioning itself to align with this standard through its metadata and smart contract capabilities, enabling seamless integration with traditional finance (e.g., for HLC trading or energy credit exchanges). For Helios, this future-proofs the launch, facilitating partnerships with financial institutions and expanding HLC's utility in a regulated economy, a key advantage over less compliant networks.

Placeholder Token Distribution

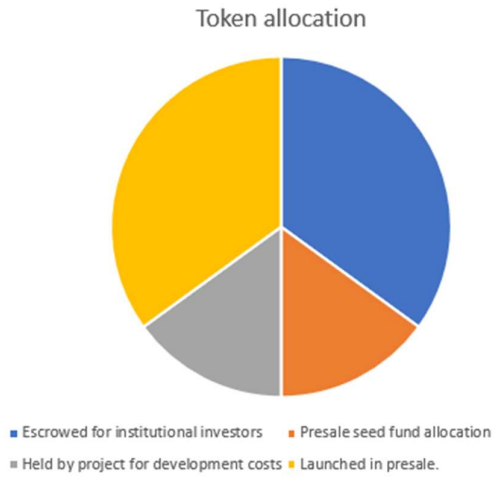
Initial Allocation (10 Million HLC):

35% (3.5 million HLC): Escrowed for institutional investment. These tokens will be set aside for the participation we expect from institutions, governments and regulatory bodies, they will be fully transparent to our community and any distribution documented and verified.

15% (1.5 million HLC): Dedicated to development, marketing, and operations (Phases 1-4).

15% (1.5 million HLC): These will be sold via private sale to initial investors. At the time of writing, October 2025, we have not allocated any of these tokens. Enquiries to info@heliosltd.tech

35% (3.5 million HLC): Fair launched on Cardano network within a liquidity pool for public trading, at a date to be announced.



Post-Launch Distribution:- Ongoing minting allocates 95% to users, with a 5% tax allocated to ongoing project expenses.

Vesting Schedule:- Any sales sold publicly will be capped at 2.5% of daily volume, meaning any sales for fund raising purposes by the project will not effect the natural price trajectory.

Value Drivers

Efficiency Correlation:- HLC value is tied to the 5-10% efficiency gain, with each coin reflecting energy savings, projected at $0.10-$0.50 initially, rising to $1-$5 by 2030 due to throttling. This does not include any speculative bubbles or institutional purchases which may occur causing fluctuations upwards and downwards in price, but reflects the project underlying value and supply and demand dynamics.

Scarcity and Throttling:- The halving schedule mimics Bitcoin's scarcity model, increasing value as issuance slows, benefiting early adopters. It will of course have to flatten out at some point in the future for the long term viability of the project, however this will be at least several years into the project.

Network Choice:- At this point, Cardano will be used for the placeholder token launch, however main net options have still to be explored and this could change in the future.

Any placeholder tokens will be redeemable for mainnet tokens at this point, the mechanics of which are TBC.

Utility:- Redeemable for upgrades, energy credits, or community projects. It will also drive "accountability" in the renewables sector, quantifying output in a publicly verifiable way, and creating "value storage" which can be used to offset high carbon projects in other fields and sectors. It can also be used to trade for offsetting purposes in a wider economy.

Economic Model

Initial Valuation: The project upon launch, as a private entity is valued at $500000, including assets and intellectual property. The crypto project is being "fair launched" on Cardano, and as such, the coin value will reflect the interest in the project, which could potentially be lower than the value of the project, or higher, depending on market dynamics.

Revenue Projections:

2026 (Phase 3): With 1000 units deployed, approximately 131,400 HLC would be minted (at 1 HLC/kWh), valuing $13140-$65570 (at $0.10-$0.50), alongside. This would generate $350000 - $1000000 in sales revenue, amounting to $87500 -$250000 token buyback. These numbers are chosen deliberately to maintain scarcity of tokens after project launch, we want to offset the fears of issued tokens being "dumped" on early investors. As such we expect the supply to be continuously shrinking for several years into the project, until such time as the coin value is far in excess of any risk taken by early investors and the project has a stable price point.

2030 (Phase 5): With 35,200 units (35.2 MW), 2.32 million HLC are minted (at 0.5 HLC/kWh post-first halving), valuing $2.32-$11.6 million (at $1-$5), plus

$12.32 million- $35,200,000 generated from hardware revenue. This will mean a token buyback equal to $3080,000 - $8,800,000.

2033: At 1% market share (70.4 MW), 4.63 million HLC are minted annually (post-second halving), valuing $4.63-$23.15 million, with hardware sales potentially exceeding $100 million.

Inflation Management: The throttled issuance schedule and 25% retail buyback work in tandem to mitigate over-issuance risks, with low network fees ensuring cost-effectiveness. Further strategies to increase scarcity will be considered TBC.

Bridging to Public Trading

Placeholder tokens will be issued enabling trading on exchanges such as Binance or Kraken post-launch. Very early on the token will be available on the Cardano decentralised trading network and we will inform users/ investors how best to set this up, with recommendations for wallets/ GUIs etc.

Two-Way Peg: A 1:1 peg links HLC placeholder to HLC main net, managed by a smart contract or oracle system, subject to rigorous security audits to ensure reliability.

Liquidity Provision: A pre-mined reserve of HLC ensures initial trading volume, with the throttled minting process gradually introducing additional supply to the market, offset initially by project token buybacks from product sales.

Placeholder Token Strategy

Purpose: The placeholder token is introduced to raise initial capital to fund Phases 1-3 (November 2025 - September 2026) prior to the deployment of the dedicated blockchain or network integration.

Token Details:

Name: Helios Pre-Launch Token (HLC)

Type: Network Cardano for the initial launch, convertible to main net HLC at a TBC date.

Supply: 10 million HLC.

Pricing: fair launched set by market.

Risks and Mitigations

Security Risk (Algorithmic Issuance): The potential for manipulation of efficiency data is mitigated through TPM encryption, AI validation, and on-chain audits, with provisions to freeze compromised issuance points.

Regulatory Risk: Compliance with FCA and EU MiCA regulations is ensured through legal consultation, potentially structuring HLC as a security token offering (STO) if required.

Market Volatility: Managed through the throttled issuance schedule and project buybacks, with community oversight to maintain stability.

Team

Allan Hawryluk – CEO. Allan is a Canadian IT specialist with a robust background in instrumentation and cryptocurrency, complemented by global deployments in the oil and gas industry and green energy projects. His expertise includes fiber-optic monitoring systems and the construction of renewable energy installations, such as solar, wind, and Tesla E-reserve projects. This hands-on experience and network equips him to optimize the Helios MPPT's AI-driven algorithms (ANN/LSTM) for real-time energy harvest in the real world, to acheive the project's efficiency goals and deployment targets. Allan's extensive work with large Bitcoin mining farms provides critical insights into scalable blockchain solutions and cryptocurrency operations. His dual expertise bridges IT infrastructure and crypto economics, supporting the project's transition from prototype to commercialization while maintaining security and performance.

James Thompson - Chief Technical Officer

James is a British Electronic Engineer with an extensive background spanning mixed-signal electronics, harsh environment systems, and embedded technologies. With over 2 decades of experience, he has worked with industry leaders in Defence, energy and commercial sectors, specializing in Mil-spec electronics, renewables, and oil and gas applications.

His expertise in designing and project managing reliable systems for challenging conditions directly informs the Helios MPPT controller's durability and efficiency, targeting a 98-99% performance level.

James also brings a pioneering spirit to cryptocurrency innovation, having patented a world-first carbon offsetting system utilizing crypto to automate carbon credits (GB2200837.9). This ground-breaking work underpins the development of the PoE mechanism, which will securely mint "Helios Coins" based on verified energy savings. His leadership ensures the integration of hardware-embedded trust (via TPM) and the closed-loop blockchain, aligning Helios with both technical excellence and economic viability.

More TBC, including some big names in the private and public sectors.

Roadmap

We didn't come this far to stop now.

Phase 1: Launch (Q4 2025)

What's Happening: Our team will craft the first working model, programming smart technology, and testing ideas in simulations.

Key Steps: Assemble the prototype, develop software to optimize solar power, and test our crypto reward system.

Milestone: A functional prototype delivering enhanced efficiency, suitable for test deployments in industry.

Crypto "placeholder" coin launched on Cardano as early seed fundraiser.

Patents filed in appropriate international jurisdictions.

Begin reach out to institutional investors and government bodies.

Phase 2: Real-World Testing (Q3 2026)

What's Happening: We're putting Helios through its paces in labs and field installations to ensure it outperforms standard systems. Allan will be co-ordinating and supervising this process with daily updates for investors.

Key Steps: Validate efficiency gains and stress test the secure coin-minting process.

Milestone: Proven results and a working crypto integration.

Partnership with several private and publicly held corporations, as well as environmental NGOs and charities.

Phase 3: Refinement and Preparation (Q2 2027)

What's Happening: We're perfecting the design, building a small commercially ready batch for testing, and securing intellectual property rights for our unique technology.

Key Steps: Enhance performance, reduce costs, and earn industry certifications.

Milestone: Certified pre-production units and patent protection underway.

In addition we expect to have several mature partnerships with private sector and government, which we will leverage for sales and market share.

Regulatory compliance will also be key during this period, and will inform a large part of our design ethos.

Phase 4: Launch and Growth (Q4 2027)

What's Happening: Helios hits the market main network, with our cryptocurrency ecosystem fully live and ready for users worldwide.

Key Steps: Partner with manufacturers, launch the app, and roll out to homes and businesses at scale.

Marketing.

Our team have strong links with the crypto community in general, and we envision a marketing strategy which will fit in well with established crypto norms.

We will invest our marketing budget in educating the crypto market in the utility of our project, and foster a "buy and hold" mentality, promoting a long-term investor outlook rather than a speculative bubble.

We will reach out to popular influencers in the space for interviews, to amplify announcements and encourage participants in the crypto space to join the conversation with our community.

As such we will be deploying a discord server, a telegram server and will be using social media tools such as Twitter, tiktok, facebook and others in order to send our message as far as possible.

We will launch competitions, discuss the project regularly in twitter spaces, do fun events such as "movie night" in our Discord server. We will encourage and fund the creation of music and literature, and yes, even memes!

This is not the whole picture however, as there is also a mainstream element to this project.

We will be planning to use any government or institutional partnerships we create in order to leverage their ability to use mainstream outlets to amplify our project message.

It is important to remember, that crypto notwithstanding, this project is a patented technological innovation which solves several real world pain points in the renewable sector. Even an end-user with zero interest in crypto would still be purchasing an MPPT controller with best in market specifications.

This is why concepts like "Carbon negative" will also be important, the idea of a renewable energy project which produces additional power as well as a free income stream for end-users is an extremely compelling proposition which we will leverage to it's full potential.

Conclusion.

- Helios is a real world hardware project designed to use cutting edge artificial intelligence in order to improve the yield of Solar power energy generation.
- The improvement in energy yield will be used as a mechanism in order to mint a crypto-currency called Helios Coin.
- As well as offering an additional income stream for the end-user, this will allow, via carbon offsetting projects, for end-users to be "carbon negative" if they use the additional income stream in order to offset carbon emissions.
- As well as these benefits, Helios hardware will make the quantification of solar power energy yields more tightly controlled, allowing accountability in the renewable sector, as end-users can use the blockchain stored data in order to showcase and demonstrate their energy production, which will address an important pain point in the renewable sector, make it easier for renewable projects to secure funding, and encourage wider adoption.
- This project will be making institutional and government partnerships and secure public funding via various grants linked to renewable energy as a core tenet of our strategy.

It all begins here, so join us at Helios and let's change the world and leave a world to our children which is better than we found it.