

# ARC: Pioneering Efficient and Secure AI for Humanity and the Environment

Date: June 2025

## Abstract

ARC is a deep tech company redefining artificial intelligence (AI) through a new standard of efficiency. Its proprietary Efficiency AI technology powers privacy-first, low-footprint, and high-performance solutions for both enterprise and consumer applications. This whitepaper outlines ARC's approach to building scalable, trustworthy AI infrastructure – highlighting its core technologies, product ecosystem, and commitment to performance, privacy, and environmental responsibility.

## Introduction

The rise of AI has brought unprecedented capabilities – but also growing concerns about excessive compute requirements, opaque decision-making, and eroding privacy. ARC was founded in 2023 to address these systemic issues by aligning cutting-edge AI development with principles of efficiency, transparency, and sustainability.

Headquartered in Zug, Switzerland, ARC designs technologies that scale more efficiently – delivering high performance without compromising user sovereignty and environmental integrity. Its core products, Reactor and Matrix, embody this mission by applying ARC's proprietary Efficiency AI architecture to real-world challenges across industries. Protocol complements this stack by protecting crypto assets with AI-powered auditing and token scoring.

This whitepaper explores ARC's product ecosystem and technical foundation – including homomorphic encryption and blockchain-integrated compliance – while outlining their impact in sectors where trust and efficiency are paramount.

## Efficiency AI: The Core of ARC's Innovation

Efficiency AI is ARC's proprietary technology, designed to deliver high-performance AI with minimal environmental impact. While specific details about the underlying models are not publicly disclosed, Efficiency AI likely employs advanced techniques such as model compression, quantization, or optimized architectures to create compact, energy-efficient language models. These models reduce carbon emissions and accelerate training processes, enabling faster insights and decisions.

### Key benefits of Efficiency AI include:

- Performance Optimization: Speeds up model training and inference for real-time applications.
- Cost Efficiency: Reduces computational resources, lowering operational costs for businesses.
- Environmental Sustainability: Significantly lowers carbon emissions, aligning with global climate goals.
- Scalability: Supports high-performance AI workloads across diverse environments.

By focusing on efficiency, ARC addresses the growing concern of AI's environmental footprint, making their solutions both powerful and eco-conscious.

## ARC's Product Ecosystem

ARC's product suite is built to serve both individuals and enterprises with solutions that prioritize performance, privacy, sustainability, and scalability. This section outlines each offering, beginning with ARC's flagship product, Reactor.

### Reactor: Multi-Efficient AI Assistant

Reactor by ARC is ARC's flagship AI assistant, designed to deliver fast, intuitive, and climate-conscious solutions for search, problem-solving, and content creation. Accessible via a web interface and APIs, Reactor empowers users with rich functionality while maintaining a low environmental footprint:

- Comprehensive Search: Real-time retrieval from platforms like X, Reddit, YouTube, and academic databases
- Image Generation: High-resolution image creation with fair-use limitations
- Advanced Problem-Solving: Handles complex tasks like mathematics, logic, and conversions instantly
- On-Chain Integration: Deployed as an agent module on Virtuals (Base Protocol), with a contract address for decentralized access via Base Contract

#### Reactor is offered in multiple tiers:

- Free (Personal): Basic chat model, standard voice mode, 7-day prompt history
- Prime (Personal): Unlimited access to advanced chat model, Deep Search capability, priority support
- APIs (Business): Scalable infrastructure with encrypted workflows
- On-Chain (Business): Fully encrypted blockchain deployment for decentralized applications

Reactor's energy-efficient design and upcoming integration of homomorphic encryption ensure privacy and sustainability, positioning it as a versatile AI layer for privacy-conscious individuals and enterprise users alike.

### Matrix: Privacy Shield for AI

Matrix by ARC is ARC's encryption layer for AI, built to deliver scalable AI Privacy for sensitive workloads in sectors such as finance, healthcare, government, military, and corporate environments. It leverages CKKS homomorphic encryption, allowing computations to be performed directly on encrypted data, ensuring data privacy and security without the need for decryption.

Matrix can operate independently with any AI model or be deployed as a privacy-preserving layer within ARC's broader stack (e.g. Reactor).

#### Matrix is offered in two configurations:

- Always Encrypted: Data and models remain fully encrypted during processing – end to end.
- Sovereign Design: Full control over data, models, and keys – no third-party exposure.
- Compliance-Ready: Transparent audit trails and access logs aligned with GDPR, HIPAA, and data location requirements.
- Enterprise Scalability: Designed to support high-performance AI workloads with minimal tradeoffs

#### Deployment Options

- Privacy-First AI Encryption Protocol: CKKS-based, compliance-ready infrastructure for enterprises
- On-Chain AI Agent (Coming Soon): Token-gated access using \$ARC, modular tooling for decentralized deployment

Matrix enables AI systems to operate securely and compliantly – delivering intelligence without ever compromising on privacy.

## Technical Foundations

ARC's product ecosystem is built on advanced technologies that enable efficiency, privacy, security, and scalability at every layer:

- Efficiency AI Models: Compact, energy-efficient language models designed for high performance and low energy consumption.
- CKKS Homomorphic Encryption: Enables private and secure computations on encrypted data, critical for Matrix's privacy infrastructure.
- Blockchain Integration: Matrix leverages blockchain technology as a foundational layer to enforce access control, ensure data integrity, and provide verifiable auditability.
- Scalable Infrastructure: ARC's systems are designed for real-time responsiveness, enterprise-grade reliability, and decentralized privacy – anchored by blockchain-based deployment capabilities.

While specific model architectures are not disclosed, Efficiency AI likely leverages techniques like model pruning or quantization to achieve its environmental and performance goals. CKKS encryption, used in Matrix, is a lattice-based scheme that supports approximate arithmetic, ideal for AI computations.

## Applications and Impact

ARC's products suite is designed to address real-world challenges across both traditional and decentralized industries:

- Reactor by ARC: Enhances productivity for individuals, businesses and developers with fast, intuitive, and environmentally conscious AI assistance
- Matrix by ARC: Safeguards sensitive data in AI workflows across finance, healthcare, corporate, and government sectors, ensuring end-to-end privacy and compliance with regulatory standards

ARC's partnership with ShidoGlobal as a validator highlights its role in Web3 infrastructure, enhancing transaction speed, safety, and cost-efficiency.

## Conclusion

ARC is at the forefront of developing AI systems that balance performance, privacy, and sustainability. Powered by its proprietary Efficiency AI technology – designed for compactness, personalization and climate-conscious performance – ARC delivers solutions that meet the evolving demands of both consumer and enterprise markets through homomorphic encryption and blockchain-based integration.

Its core products – Reactor and Matrix – address critical challenges in productivity, efficiency, data privacy, security, and regulatory compliance. As ARC continues to innovate, it remains firmly committed to its mission: enabling AI that serves both people and the planet.