



# Digital Assurance for the Future of Carbon Markets

A Supremesoft & DNV Strategic Partnership

*Transforming Measurement, Reporting, and Verification through real-time digital infrastructure for carbon credits and renewable energy certificates.*

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# Why Malaysia: A Market Ready for Digital MRV

## National Energy Transition Roadmap

*Malaysia's ambitious NETR targets 70% renewable energy by 2050, creating unprecedented demand for credible MRV systems. The government mandates rigorous verification protocols for all carbon projects.*

## Bursa Carbon Exchange

*Asia's first regulated carbon exchange launched in 2023, establishing Malaysia as a regional hub. BCX requires transparent, verifiable data streams for all traded credits and RECs.*

**40+**

GW of renewable capacity

*Planned by 2035 under NETR*

**\$500M**

Market value

*Projected BCX trading volume by 2026*

**100%**

Digital verification

*Target for new projects by 2027*

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# The Manual MRV Bottleneck

*Traditional verification methods create significant barriers to scaling carbon markets in Malaysia and across ASEAN.*



## Slow Verification

*Manual data collection and validation extends audit cycles from days to weeks, delaying credit issuance and revenue realization.*



## High Costs

*Field visits, manual reconciliation, and document processing drive verification costs to \$15,000-\$25,000 per project assessment.*



## Data Integrity Risks

*Manual transcription errors, timestamp inconsistencies, and version control issues compromise audit trail reliability.*



## Limited Scalability

*Physical site visits constrain VVB capacity, preventing rapid expansion needed for Malaysia's renewable boom.*



# ResiliLink dMRV: The Digital Solution

*A robust platform integrating industrial IoT, AWS Cloud infrastructure, and AI-driven analytics to automate Measurement, Reporting, and Verification for carbon and REC projects.*

01

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## Real-Time Data Capture

*Industrial IoT sensors continuously monitor energy generation, emissions, and environmental parameters with millisecond precision.*

02

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## Automated Validation

*AI algorithms validate data quality, detect anomalies, and apply ISO 14064-2 calculation methodologies automatically.*

03

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## Immutable Audit Trail

*Blockchain hashing creates tamper-proof records, ensuring data integrity from sensor to verification report.*

04

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## Verified Output

*Generate VVB-ready reports with full audit trails, reducing manual work and accelerating credit issuance.*



# Technical Architecture: From Edge to Cloud

## Edge Layer



*Advantech industrial IoT gateways collect data from SCADA, meters, and environmental sensors. Hardware-validated timestamps ensure data provenance.*

## AWS Serverless

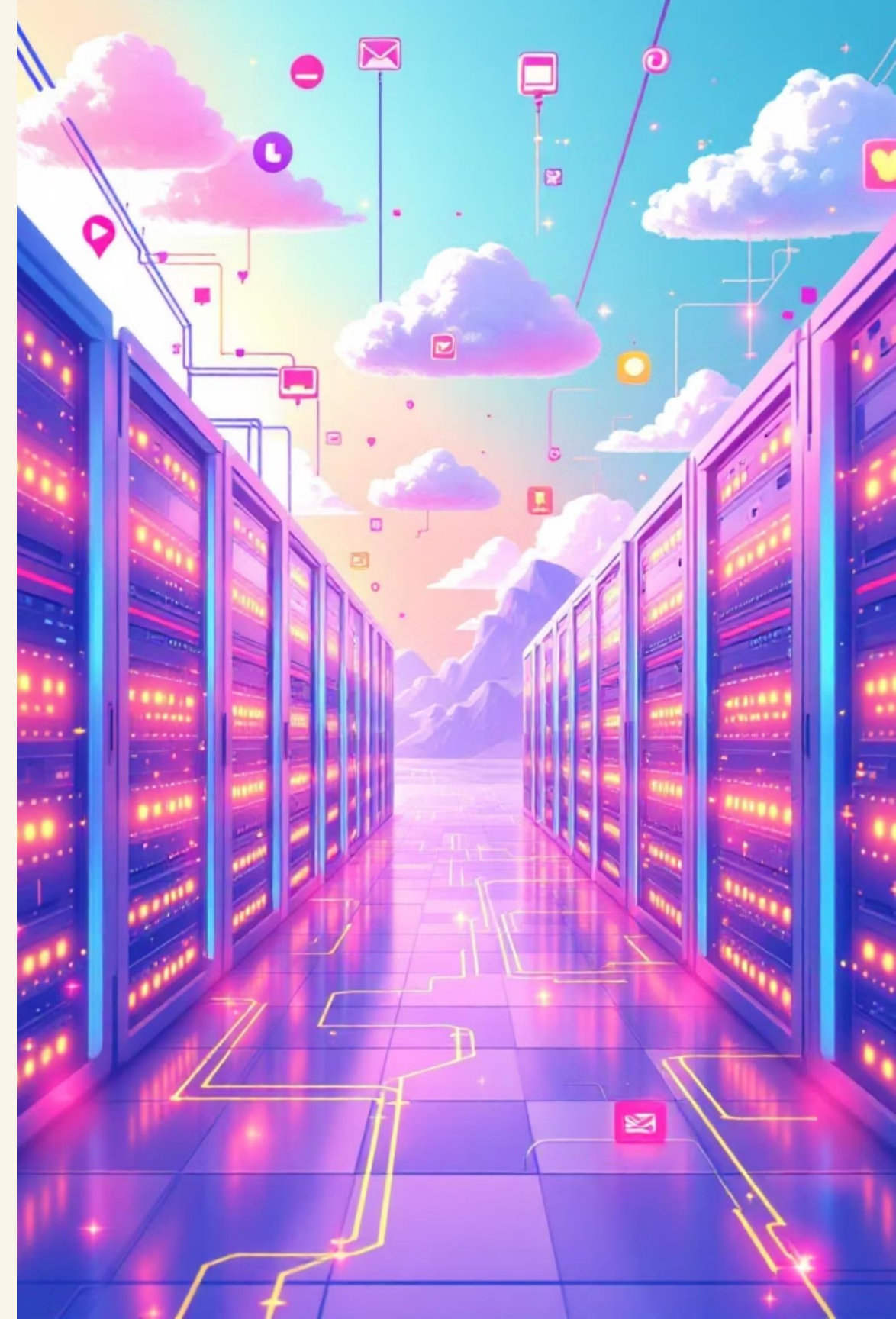


*Event-driven Lambda functions process data streams in real-time. DynamoDB stores time-series data with 99.999% durability. API Gateway exposes verified datasets.*

## Security Pipeline



*End-to-end encryption, role-based access control, and blockchain anchoring ensure data integrity meets ISO 27001 and SOC 2 standards.*

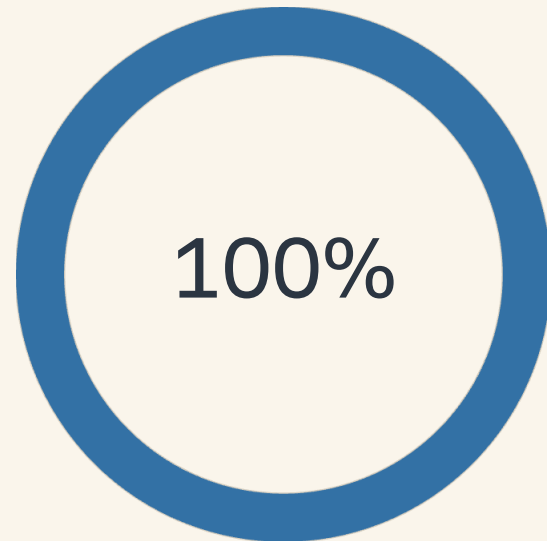


# Trust Through Technology

## Blockchain-Enhanced Audit Trails

*Every data point captured by ResiliLink is cryptographically hashed and anchored to the blockchain, creating an immutable audit trail that withstands even the most rigorous VVB scrutiny.*

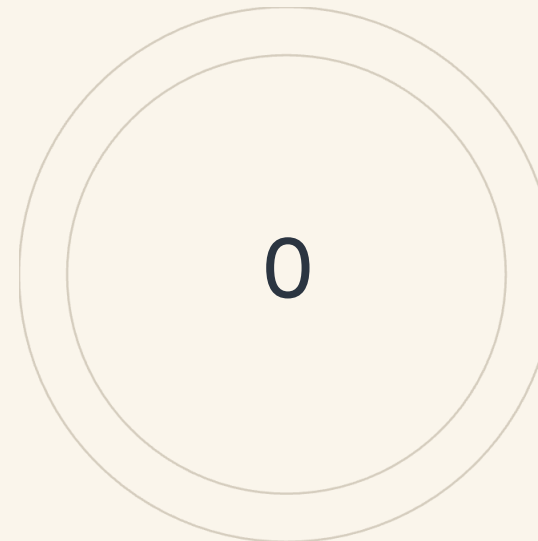
- *SHA-256 hashing ensures data cannot be altered retroactively*
- *Timestamp anchoring provides indisputable temporal proof*
- *Automated hash comparisons detect any data manipulation*
- *Full chain-of-custody from sensor to report*



Data Integrity  
*Immutable records*

## ISO 14064-2 Compliant

*ResiliLink's data architecture and validation workflows are designed to meet ISO 14064-2 requirements for quantification, monitoring, and reporting of greenhouse gas emissions.*



Data Manipulation  
*Detectable anomalies*



# Case Study: 5MW HHFS Hybrid Hydro-Floating Solar

*Malaysia's first Hybrid Hydro Floating Solar installation at the Bakun Dam serves as a global proof-of-concept for automated dMRV in complex renewable projects.*

## Project Overview

*5MW floating solar array integrated with 2,400MW hydroelectric facility. Dual-generation monitoring with shared transmission infrastructure.*

## ResiliLink Implementation

*27 IoT sensors deployed across floating array and hydro intake. Real-time generation tracking with weather correlation algorithms.*

## Results Achieved

*85% reduction in manual data collection, 100% data availability during monsoon season, automated REC calculation with 99.97% accuracy.*



# The DNV Advantage: Remote Digital Verification

## 40% Reduction in Audit Time

*Pre-validated data streams eliminate manual reconciliation, allowing DNV verifiers to focus on exception analysis and critical review rather than data entry.*

## Reduced Travel Overhead

*Remote monitoring enables virtual site verification for routine assessments, reserving physical visits for initial commissioning and high-risk findings.*

**40%**

Time savings

*Per verification cycle*

**\$10K**

Cost reduction

*Average per-project savings*

**3x**

Capacity increase

*Verifiers can handle more projects*

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# Go-to-Market Roadmap 2026

- 1** — Q1: Technical Showcase  
*SusHi Tech Tokyo (April) - Joint demonstration with DNV Japan showcasing ResiliLink integration and remote verification capabilities.*
- 2** — Q2: VVB Pilot Launch  
*Launch pilot program with 3 Malaysian renewable projects, including HHFS follow-up and two new solar installations.*
- 3** — Q3: ASEAN Expansion  
*Expand to Thailand and Indonesia markets, leveraging DNV's regional VVB presence and existing renewable portfolios.*
- 4** — Q4: Regional Scale  
*Establish ResiliLink as preferred dMRV platform for ASEAN carbon markets, targeting 15+ projects under verification.*



# Let's Build the Future Together

## Proposed Joint Pilot Project

*Launch a collaborative pilot verifying 5 renewable energy projects in Malaysia using ResiliLink dMRV, with DNV Japan as the designated VVB. This pilot will establish operational protocols, validate cost savings, and create a replicable model for ASEAN expansion.*

### Technical Alignment

*Joint working group to integrate ResiliLink data outputs with DNV's verification methodologies and reporting templates.*

### 3-Month Timeline

*Accelerated deployment targeting Q2 2026 launch with full technical documentation and audit trail samples.*

### Shared Investment

*Co-investment structure with clear ROI metrics including reduced verification costs and accelerated credit issuance.*

*"Together, Supremesoft and DNV can establish the gold standard for digital MRV in Asia's rapidly expanding carbon markets."*