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Power for Thai Happiness

Reaching Low-Carbon Digital Foundation (Infrastructure)

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Electricity Generating Authority of Thailand (EGAT)

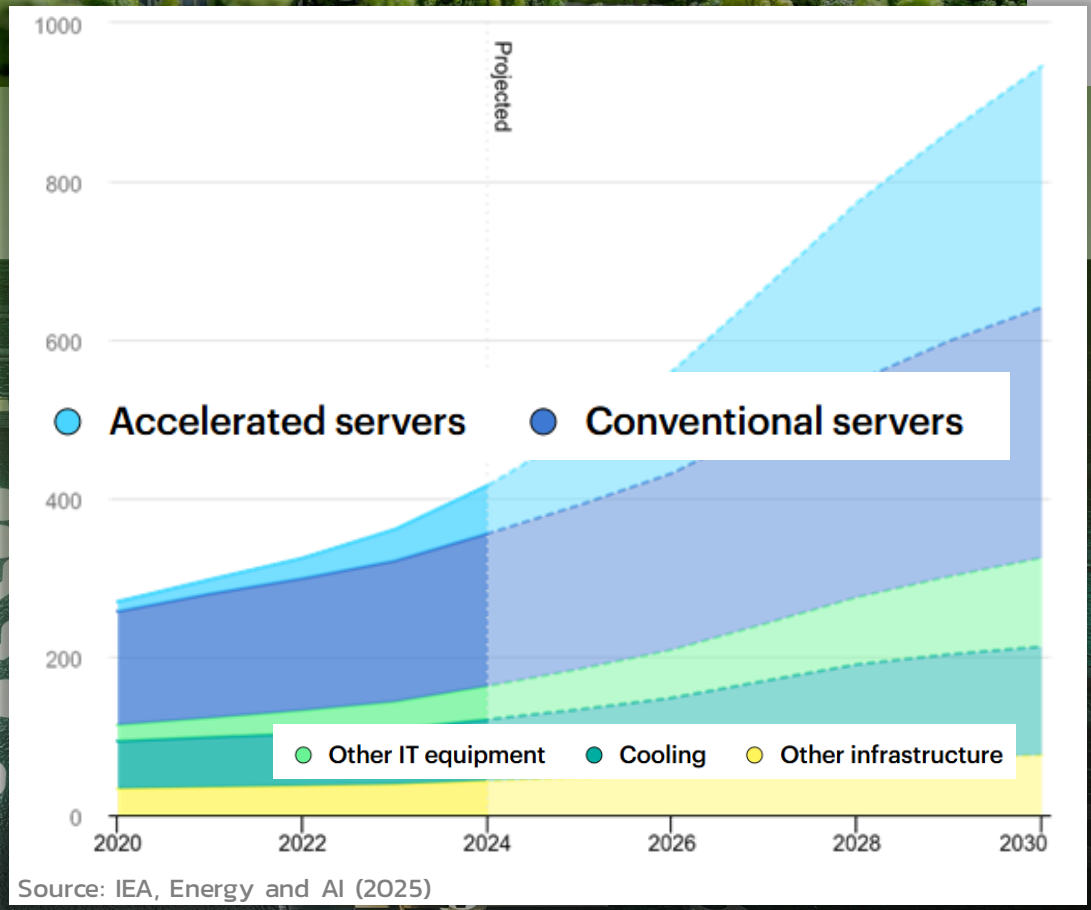
Energy demand from AI

Total data center electricity consumption is on track to …

- Nearly double from ~415 TWh (2024) to ~945 TWh by 2030 — a **+128% increase over 6 years**
- Growth rate: **~15% per year** from 2024–2030, more than **4X faster** than all other sectors combined

AI workloads (accelerated servers + GPU clusters) account for **nearly 50% of all net new electricity demand** in data centers through 2030

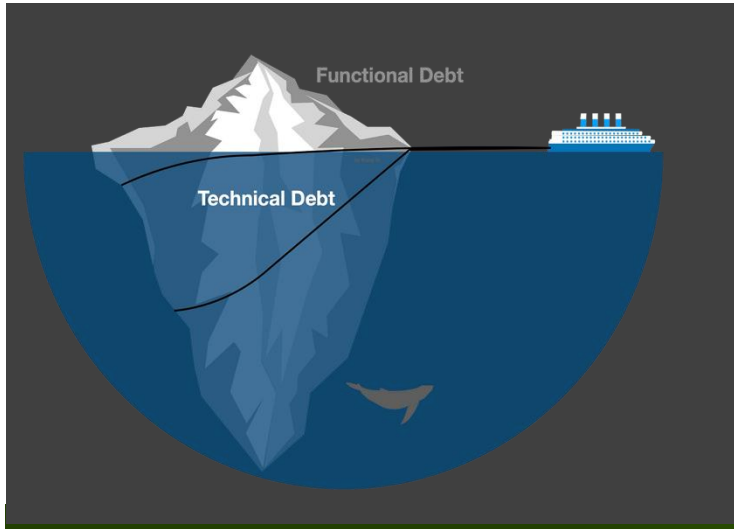
ที่มา : INTERNATIONAL ENERGY AGENCY



Source: IEA, Energy and AI (2025)

AI Growth, *Hidden Debt*

Energy Blind Spot



Scalability Debt

Resource Sprawl

3x More energy than necessary.

~40% Systems Fail at Scale.

~30% Resources Wasted. Nobody's Tracking.

https://www.iea.org/reports/energy-and-ai/energy-demand-from-ai
https://www.gartner.com/en/infrastructure-and-it-operations-leaders/topics/technical-debt

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Low-Carbon by Design — AI, Data & Cloud

*Carbon efficiency must be **engineered into infrastructure architecture** — from hardware selection to data centre design — before a single workload runs.*

- **Energy-Efficient Hardware Selection**
- **Data Centre Power Usage Effectiveness**
- **Infrastructure Right-Sizing & Auto-Scaling**
- **Energy Optimization Design Innovation**
  AI-Driven Infrastructure Orchestration

Sustainable Scalability by Design

Principles for Sustainable Scalability

- Horizontal over Vertical
- Adaptive Auto-Scaling with Smart Cool-Down
- Event-Driven Architecture
- Immutable Infrastructure for Consistency and Reliability

Energy-Aware & Resource-Efficient Tech

Immediate Actions: Practical Best Practices

- Auto-Scale, Not Always-On
- Optimise Models, Not Just Infrastructure
  – Use the Right Compute for the Job
- DevOps as an Energy Discipline
- Set Energy Budgets Like Cost Budgets
- Reuse Before Rebuild
- Decommission Aggressively *– Stay Lean by Design*

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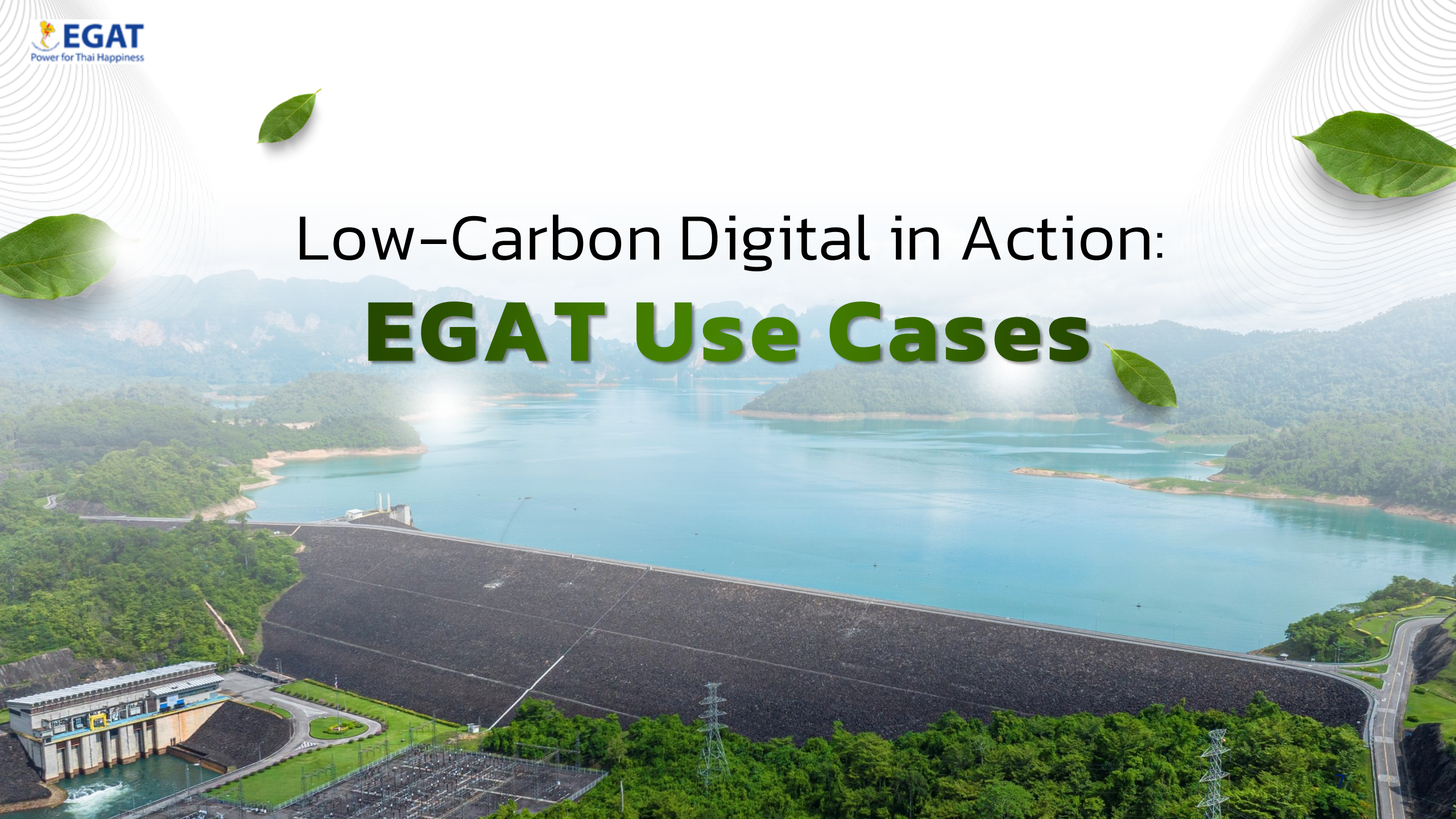
Low-Carbon Digital in Action:

EGAT Use Cases



Innovate Power Solutions for a Better Life

INNOVATION

POWER SECURITY

GREEN SOCIETY /CARBON NEUTRALITY

AGILE ORGANIZATION

CUSTOMER/ STAKEHOLDER ENGAGEMENT

GOOD GOVERNANCE

EGAT SUSTAINABILITY

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EGAT Strategic Approach

to Building a Low-Carbon Digital Foundation

- Computing Resource Optimization
- DevOps Platform

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EGAT *Computing Resource Optimization* Project

Target

Reduce vCPU in EGAT Private Cloud

> 12% (≥ 982 vCPU)

By Oct 2024

Baseline (Oct 2023)

8,186 vCPU

Duration: Oct 2023 – Oct 2024

Computing Resource Optimization 2025

Approach 1	Approach 2	Approach 3
Delete Obsolete VM	**Right Size VM**	**Merge VM**
Expected: 651 vCPU	Expected: 267 vCPU	Expected: 136 vCPU
Actual: **752 vCPU**	Actual: **336 vCPU**	Actual: **114 vCPU**
(62 %)	**(27 %)**	**(9 %)**

☑ Total Result: vCPU Reduction

1,202 vCPU (14.68%) *form Target 982 vCPU*

Exceeded Target

+220 vCPU

Reduced Server Procurement	Server Cost Saving	Electricity Cost Saving	CO_2 Reduction
4 Servers	**19.07 MTHB**	**291,084 THB**	**30,829 kgCO_2eq**
Year 2026	*Over 5 Years*	*Over 5 Years*	*Over 5 Years*

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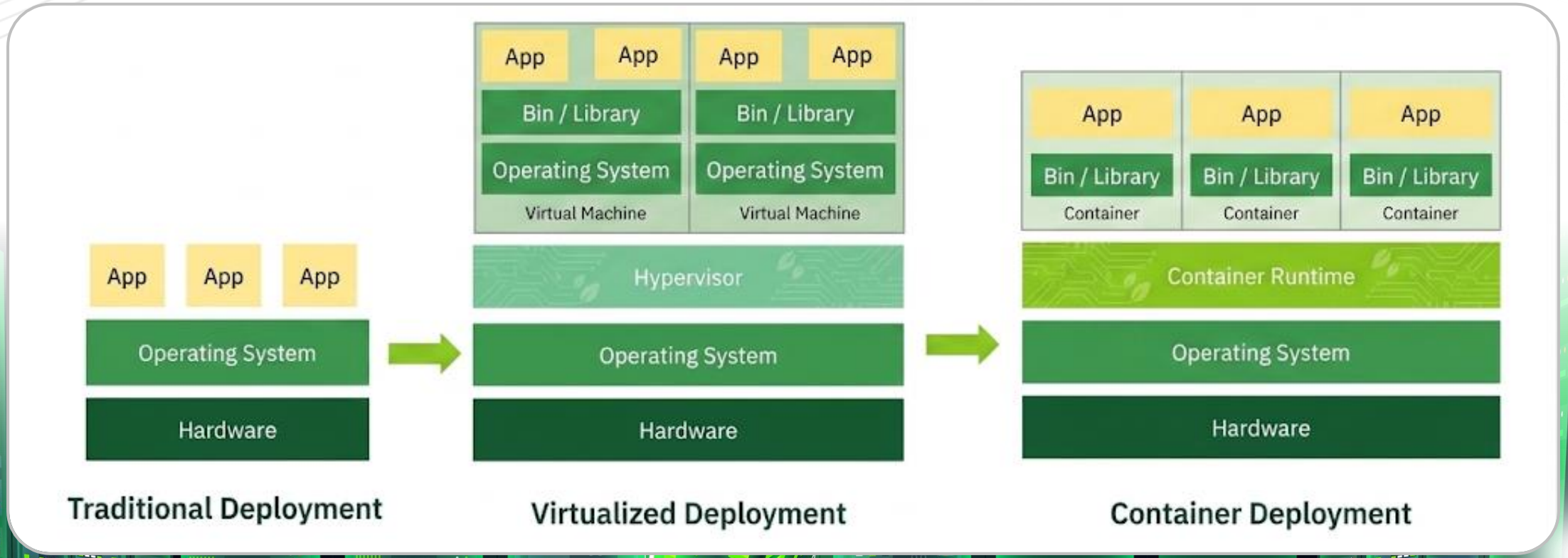
EGAT Roadmap for
Virtualization Management



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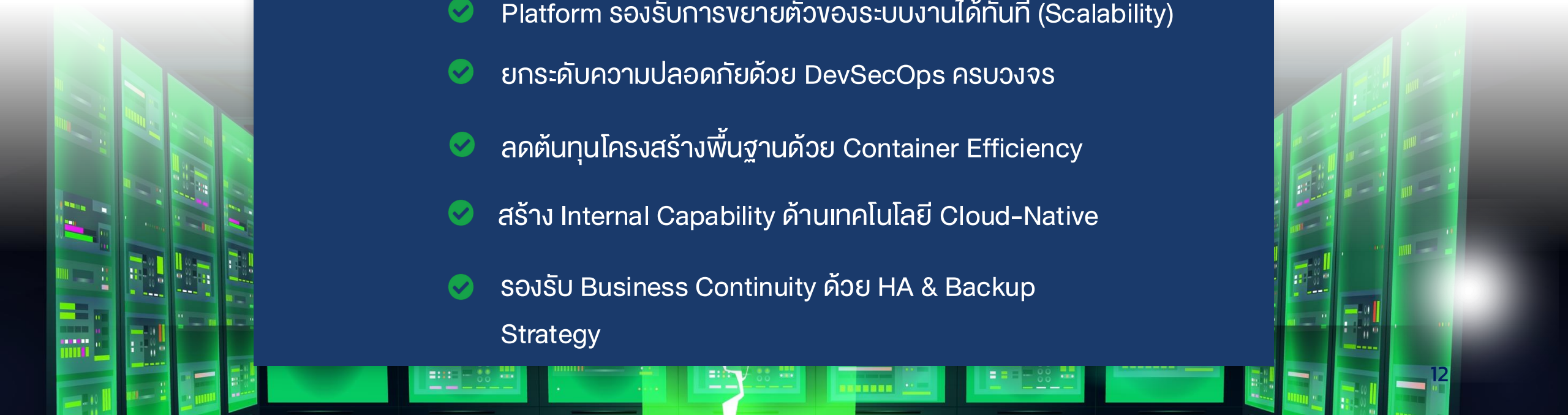
EGAT Roadmap for
Virtualization Management

ประโยชน์ ที่ได้รับจากการดาเนินการ เรื่อง DEVOPS

- ลดเวลาการ Deploy ระบบใหม่จากสัปดาห์เป็นชั่วโมง
- Platform รองรับการขยายตัวของระบบงานได้ทันที (Scalability)
- ยกระดับความปลอดภัยด้วย DevSecOps ครบวงจร
- ลดต้นทุนโครงสร้างพื้นฐานด้วย Container Efficiency
- สร้าง Internal Capability ด้านเทคโนโลยี Cloud-Native
- รองรับ Business Continuity ด้วย HA & Backup Strategy



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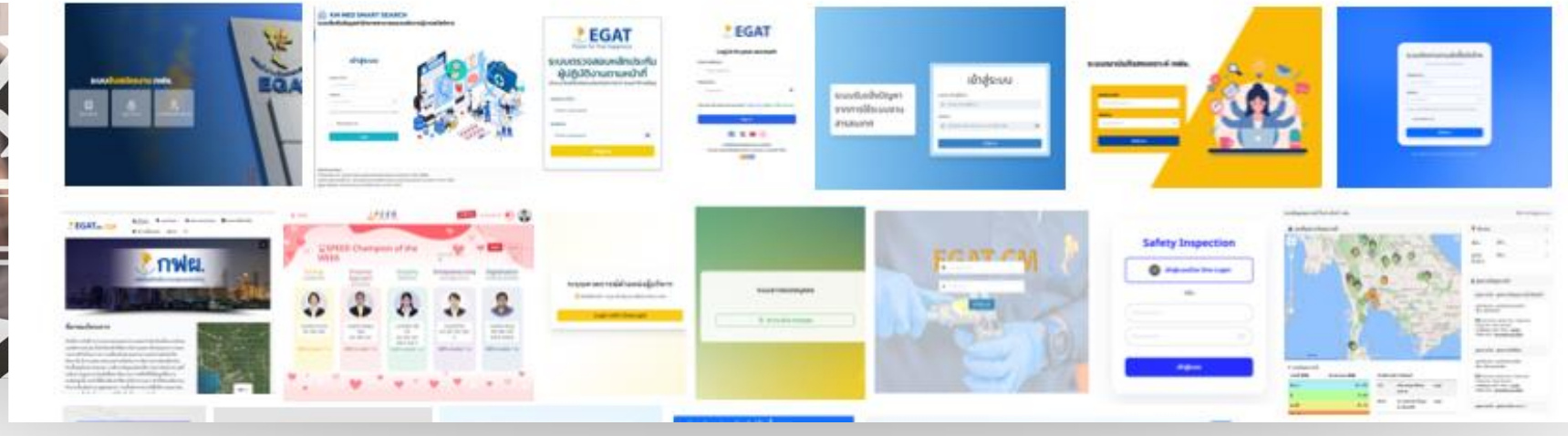
EGAT DevOps Platform

Platform enables instant scalability to support growing workloads



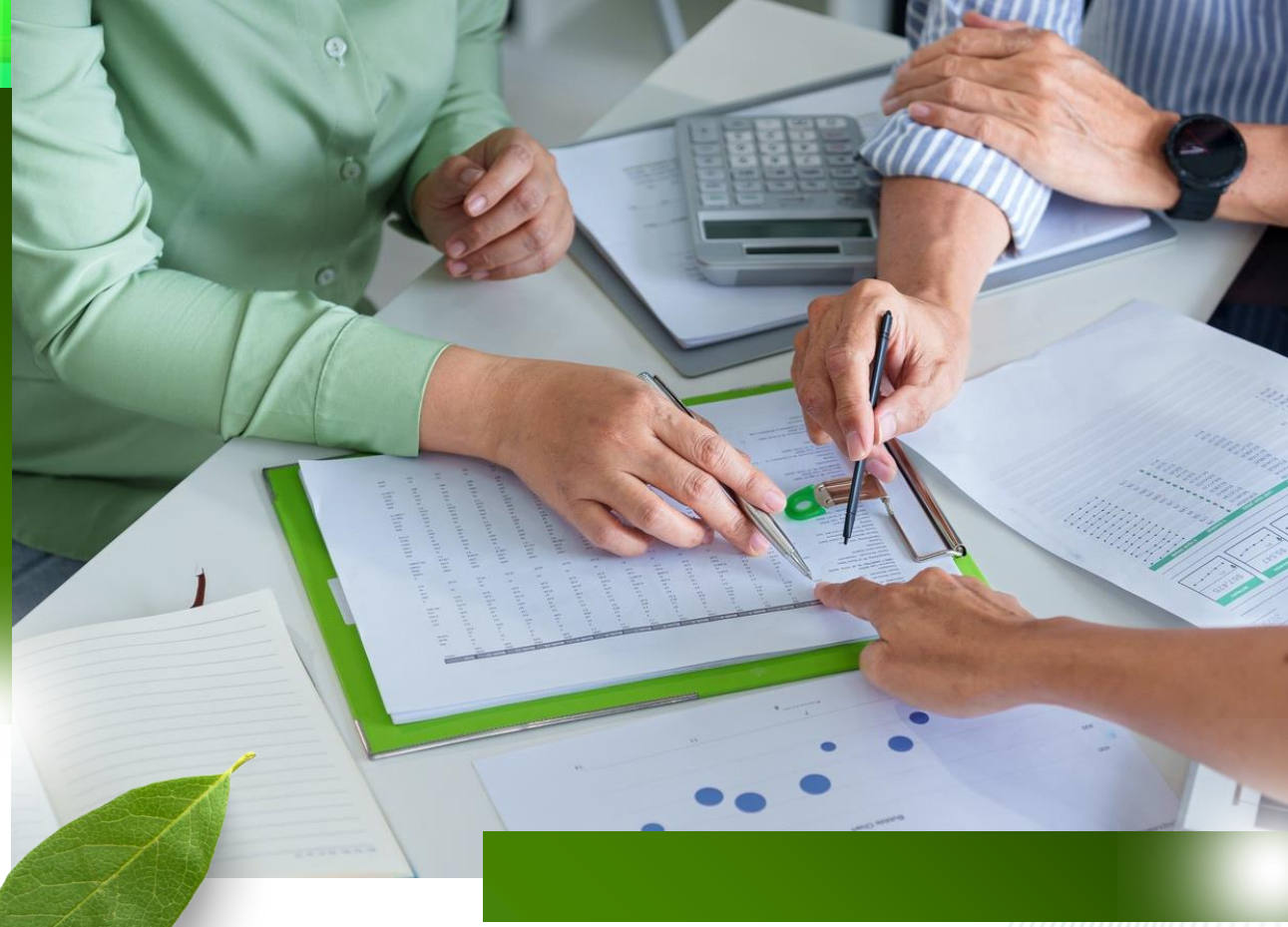
40
Applications

300+
Active Containers

99.9%
Platform Availability

1.8
tCO2e / year

Electricity Savings ≈ 22,000 THB/ year



Private Cloud Redesign

Achieve ≥ 10 server reduction

Public Cloud Optimization

Public Cloud Cost Reduction ≥ 25%

Scale Up DevOps Platform

50+ Systems Enabled | Full GitOps | Zero-Touch Deployment | AI-Assisted Operations

EGAT Moving Toward a Low-Carbon Digital Future

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Key Benefits

- Cost & Carbon Reduction through Container & Energy Efficiency
- Maximize Resource Efficiency while Reducing Waste
- Stronger Security with DevSecOps & VM Cleanup
- Faster Deployment and Strong Business Continuity

Driving Impact through Measurable and Scalable ***KPIs***

Energy Efficiency

e.g., PUE (Power Usage Effectiveness), Data Centre Energy Consumption, Renewable Energy Ratio

Resource Efficiency

e.g., Legacy System Retirement Rate, Server Utilization Rate, Incident Energy Waste

Reliability KPIs

e.g., System/ Platform Availability, MTTR (Mean Time to Recovery), Autoscale Success Rate

Carbon & Emissions

e.g., Carbon Savings/ Carbon Reduction, Carbon per Compute Hour

EGAT Decabonization Solution

GHG emission baseline

Set emission reduction goals

Develop emissions reduction roadmap

Initiate and scale key decarbonization projects

Purchase and offset with EACs

Report progress

Energy Solutions
Solar + BESS
Solar GSA, Solar EPC, Solar PPA

Energy Efficiency Energy Management
ENZY Platform, EMS Platform

Mobility Solutions
EV Total Solutions:
Elex by EGAT, ElexXa, BackEN EV
EV Fleet, Flexx fast

AI Digital Solutions
AI & Cleaning BOT, AI & UVV & UAV for Solar and Powerplant

REC Carbon Credits

UGT 1 & 2

REC Issuer

REC & Carbon Credit Aggregator

Direct PPA

Full Reporting Service

GHG Reporting Platform
Scope 1, 2, 3

Consultation Service

Consultation Service

1 BASELINE

2 GOALS

3 ROADMAP

4 PROJECT IMPLEMENTATION

5 CREDITS

6 REPORT

Measurement

Strategy

Implementation

Reporting

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Low-Carbon. High Impact. Sustainable Future.