On The Road to a Low Carbon Digital Economy

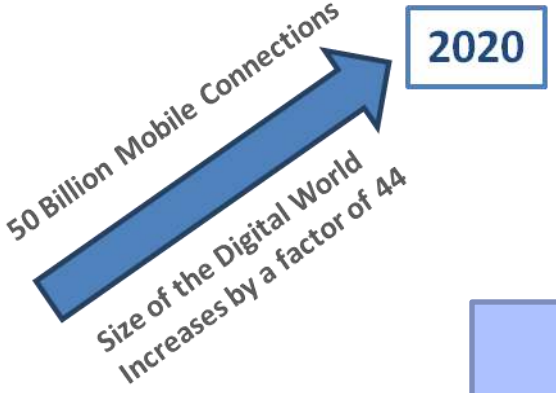
Strategies for Digital Oman

عمان الرقمية
e.oman

GCI Green Computing Initiative

Information Technology Authority
Sultanate of Oman

ICT Industry Growing at a Phenomenal Rate

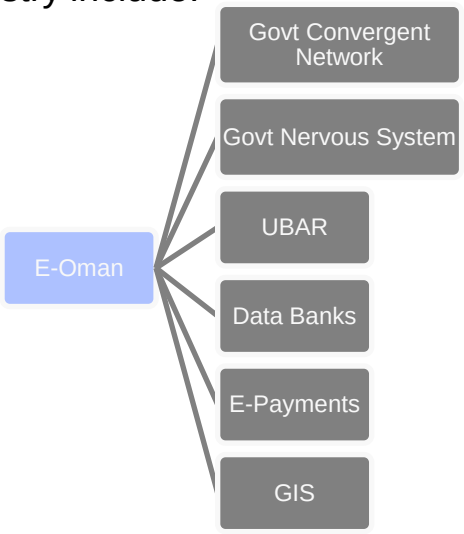


* Source: IDC 2012 Digital Universe Report

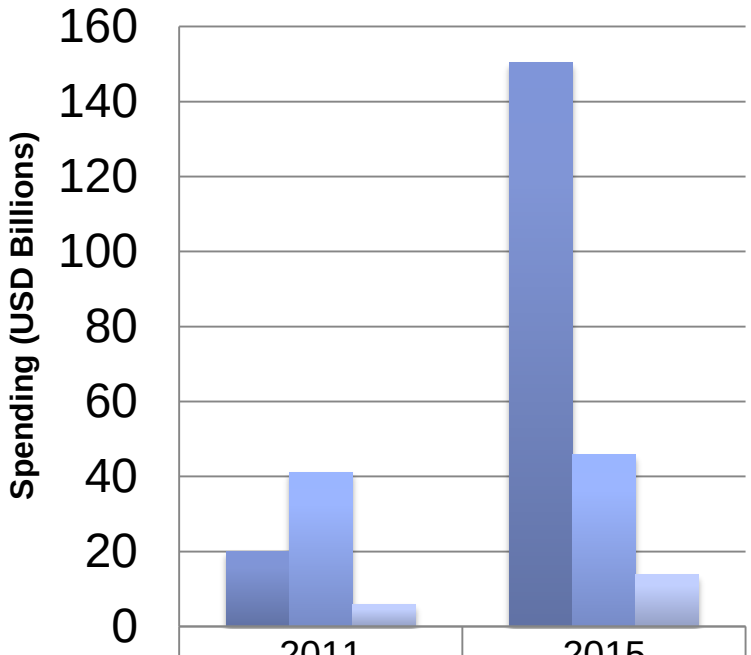
In 2012, Oman's ICT industry was worth US$363M with a 6% CAGR.

* Source: Business Monitor International

Growth Drivers for Oman's ICT Industry include:



Forecasted Global ICT Spending



	2011	2015
Enterprise Equipment	20	150.3
Internet Access	41.2	45.9
IPTV Subscription	5.9	13.9

* Source: Telecommunications Industry Association 2012 Market Review & Forecast

With Growth Comes Challenges

2.0% of the world's carbon emissions is from ICT with an annual rate of increase of about 6%.

* Source: SMARTer 2020 Report by Global e-Sustainability Initiative (GeSI) & Climate Group & separate study by Gartner

The global ICT industry was responsible for 900 million $MTCO_2e$.

* Source: Based on data from International Energy Agency (IEA)

2011

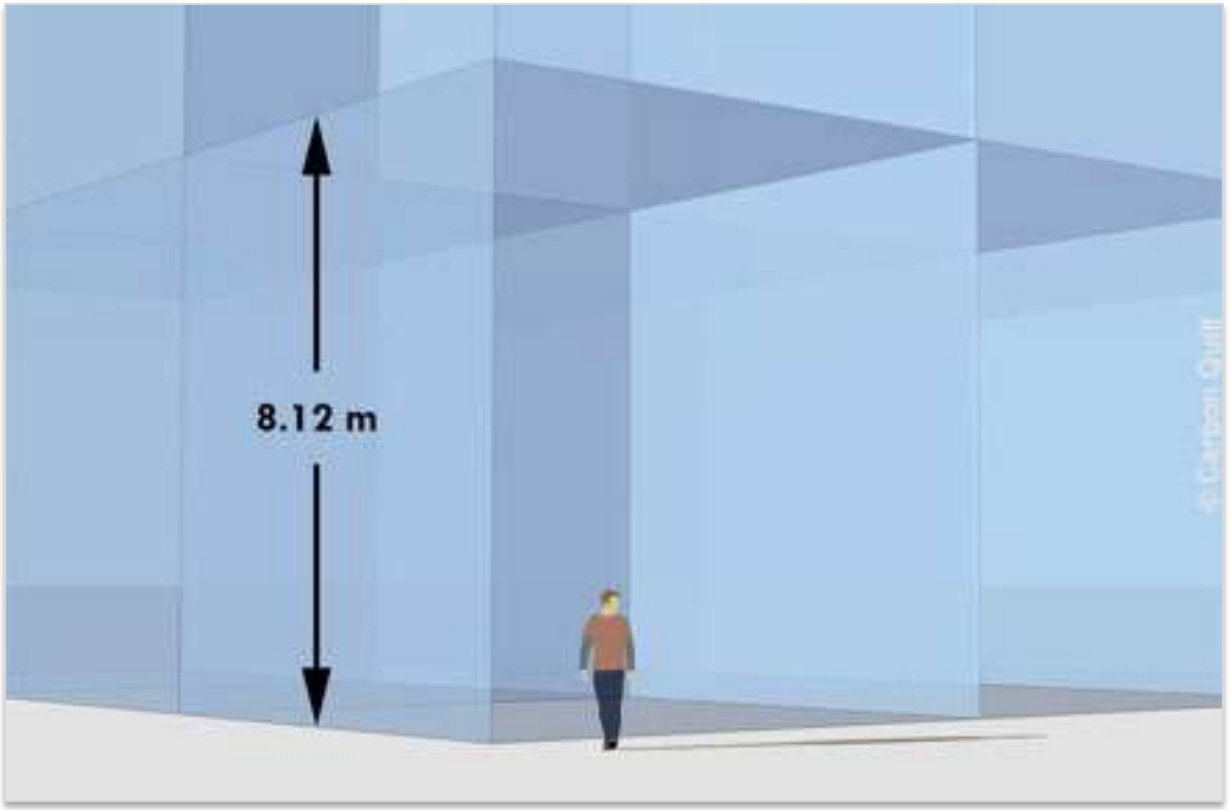
The local ICT industry consumed 1.76 billion KWh units of electricity.

* Source: Based on 8% of total electricity and data from IEA and benchmarked against Australia, UK and USA.

The local ICT industry spend OMR44 million on electricity and emitted 1.23 million $MTCO_2e$.

* Source: Based on average of 25 bz per kWh & EF of 0.7

Visualizing 1 Metric Ton of CO_2



Cube 8m x 8m x 8m / 27ft x 27ft x 27ft

With Challenges Come Opportunities

ICT can increase its own energy efficiencies

ICT can increase the energy efficiencies of other sectors

Green Of ICT
[2% of market opportunity]

Green By ICT
[98% of market opportunity]

ICT Industry Focused

Potential RM10 Billion in savings

Cross Sectoral Approach

ICT As An Energy Efficiency Enabler

Potential RM42 Billion in savings

While the ICT industry can reduce its own emissions through effective energy efficiency strategies, there is a tremendous opportunity for ICT solutions that reduce the 97% of emissions coming from the rest of the economy.

Oman's Digital Economy

A Low Carbon Economy

A low carbon economy is one where all waste must be minimised, energy must be produced using low carbon energy sources and methods, all energy resources must be used efficiently, and wherever realistic local needs should be served by local production with a high awareness and compliance with environmental and social responsibility initiatives.

Key Features

- Energy Efficiency
- Minimal Waste
- Low Carbon Energy
- Locally Sourced
- Environmental Compliance
- Social Responsibility

Leading To Key Benefits

Lasting Energy Security, Energy Cost Savings, Environmental Stewardship

Green Jobs Generation, GNI Contributions, Quality of Life Improvements

Oman's Low Carbon Digital Economy

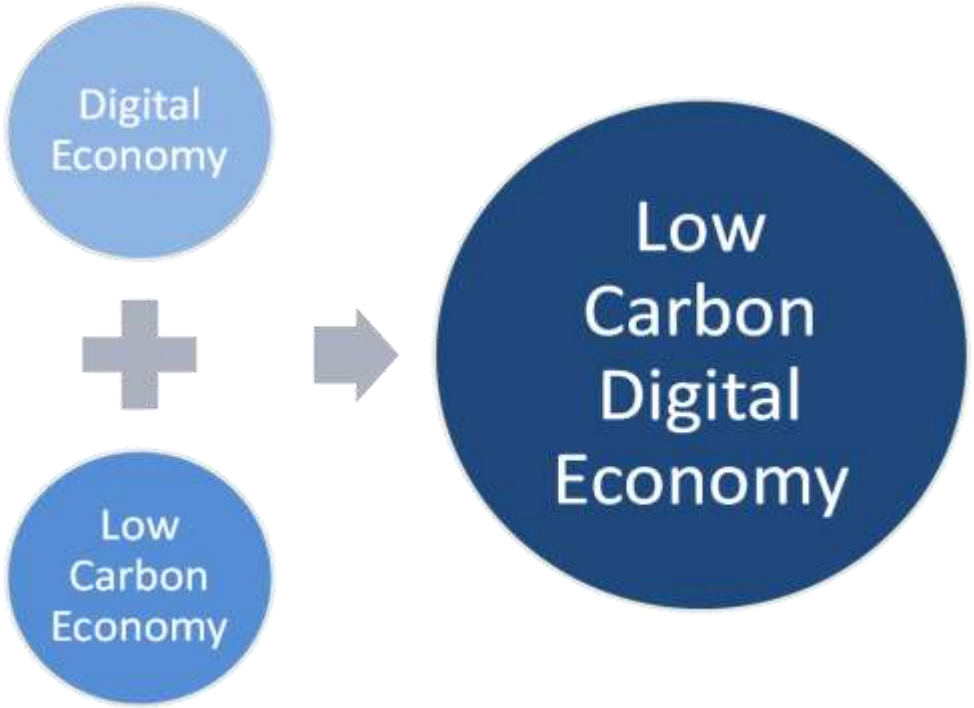
Green Of ICT [Sustainable Computing]

- Green Computing Facilities
- Virtualization & Consolidation
- Cloud Computing
- Grid Computing
- Power Optimization
- Greenware
- E-Waste

Green By ICT [Low Carbon Enabler]

- Smart Built Environment
- Internet of Things
- Telecommuting
- Carbon Accounting
- Resource Intelligence
- Sustainable BPM
- Green Supply Chain
- Green Manufacturing

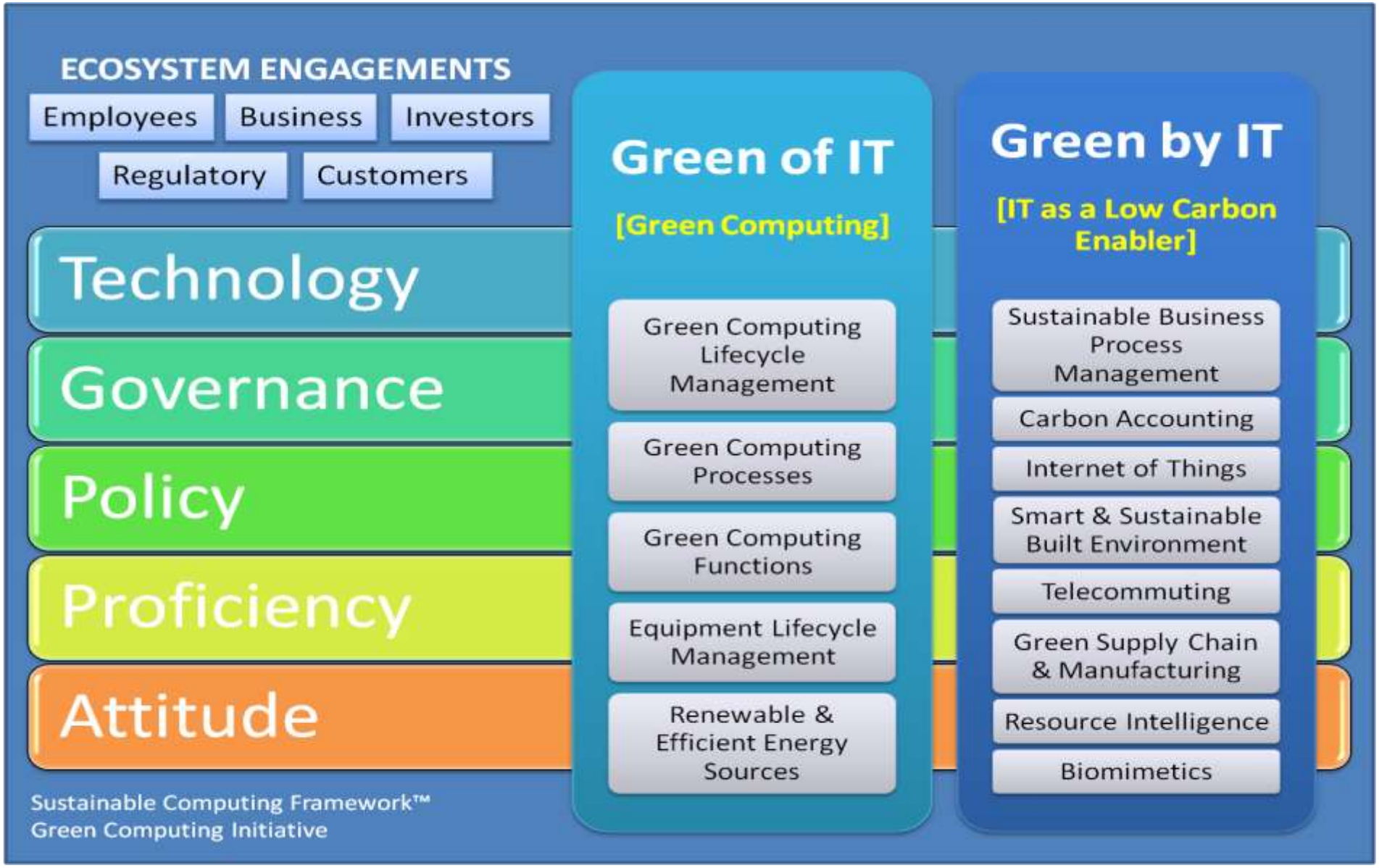
Oman's Low Carbon Digital Economy is one where ICT acts as a low carbon enabler across multiple sectors whilst ensuring its own environmental sustainability and energy efficiencies.



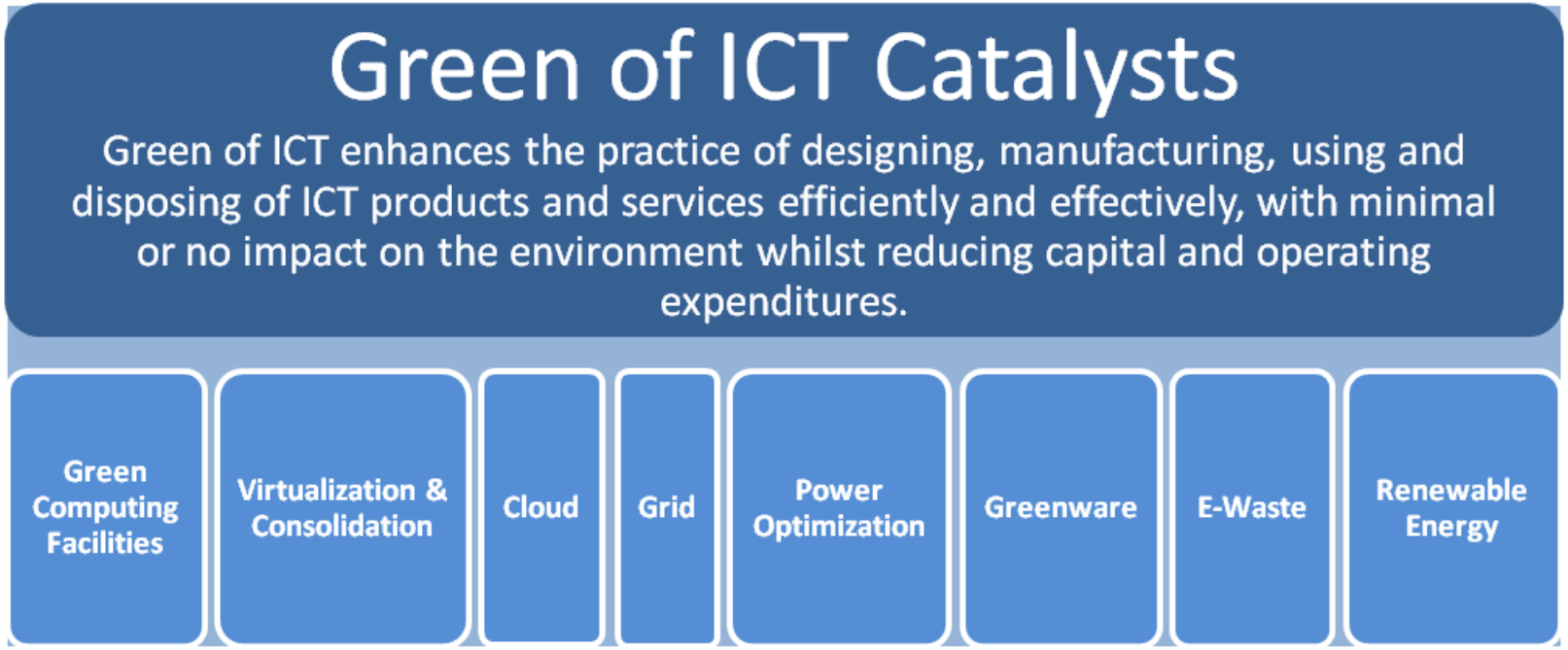
The Case for a Low Carbon Digital Economy: Key Benefits

Economic Benefits	Generation of high knowledge-add green jobs
	Creation of a new class of ecology entrepreneurs called Ecopreneurs
	Increased ICT exports
	Increased GNI, FDI and DDI
	Improved global innovative competitiveness
Environmental Benefits	The potential reduction in green house gas emissions through a low carbon digital economy is substantial
	E-waste initiatives contribute to a host of other environmental protection strategies
Social Benefits	Improvements in the quality of life, health, and well-being of Omani citizens

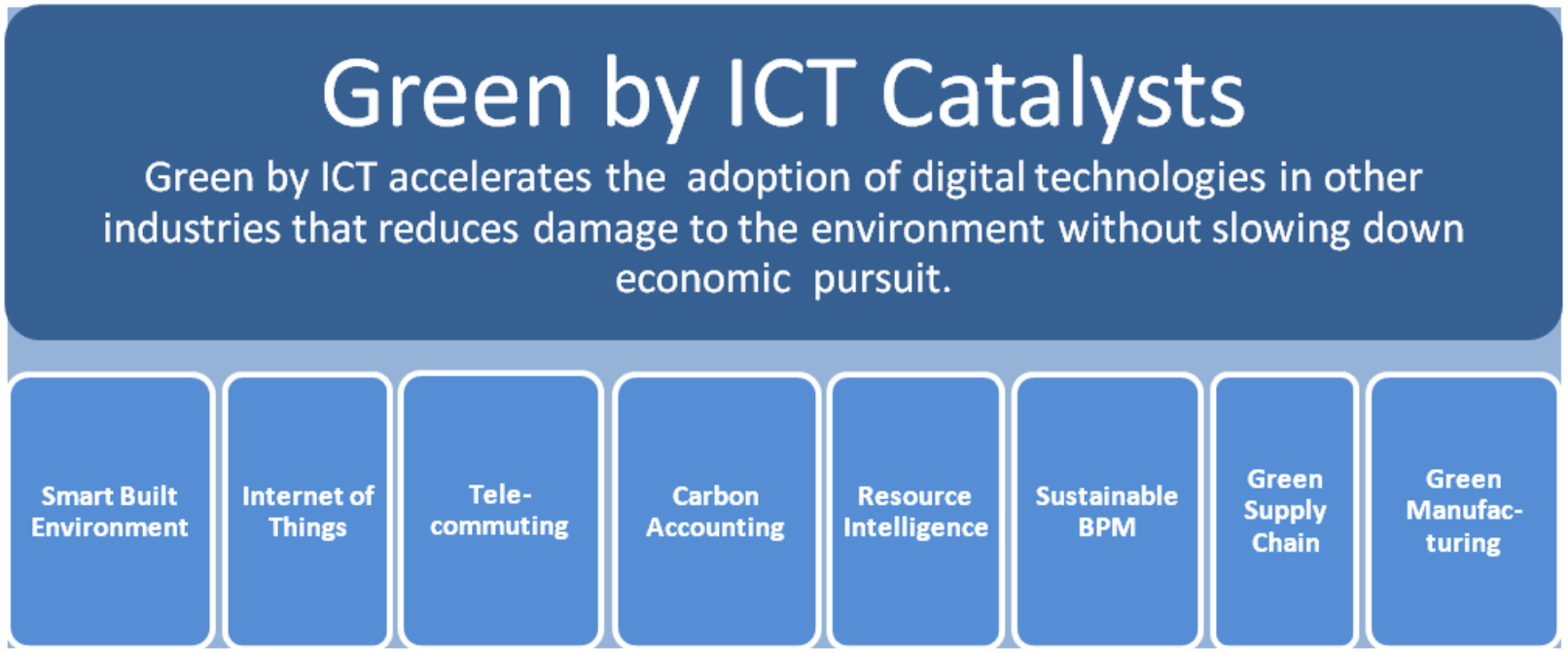
A Guiding Framework



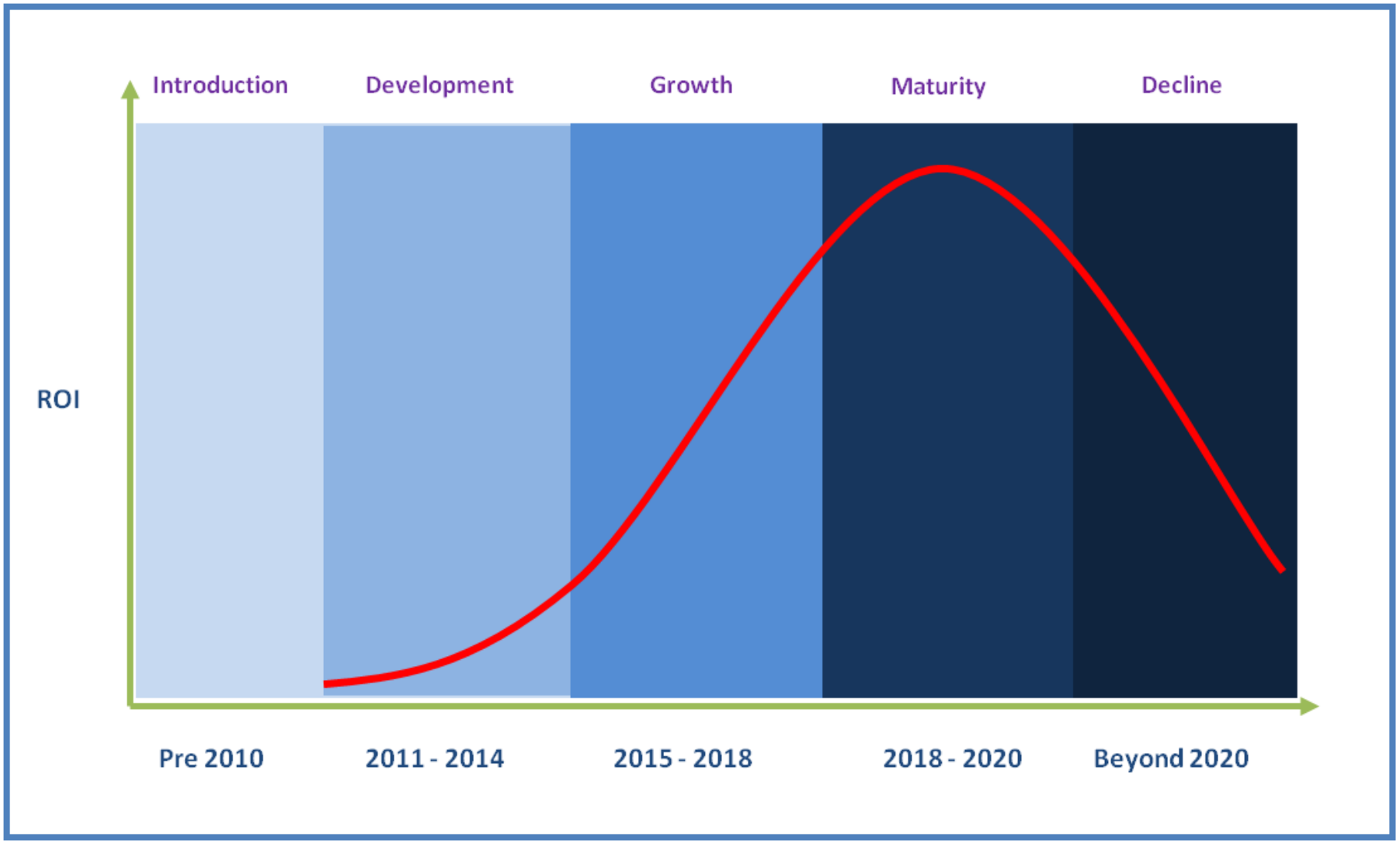
Green of ICT Catalysts



Green by ICT Catalysts



Green ICT Industry Gaining Traction



Current Trends in Green ICT

- Increasing Electricity Tariffs Making OPEX Higher
- Accountability for ICT Energy Costs Being Taken By IT Head
- CEO's Executing Their Responsibility To Embed Sustainability
- Regulatory Requirements for Reporting and Carbon Tax
- Innovation on Green ICT
- Incentivizing Going Green

Future Data Centres

CURRENT INDUSTRY FACT

For every watt needed to power a server, 1 watt is required for cooling.

[Eco² System] FACT

For every watt needed to power a server, **0.05 watt** is required for cooling.

[Eco² System]

HOW?

Simple. We do away with CRAC, CRAH, Chillers or Fans. Air is poor heat conductor. Kept at 21°C (7°C at chiller) to keep servers cool.

WHAT!!?

Our system features cutting edge submersive cooling which is 1350 times more efficient at holding heat than air. **[Eco² System]** at 38°C is as efficient as 21°C air.

You Probably Wondered…

From This..

To This. An Eco^2 Facility.

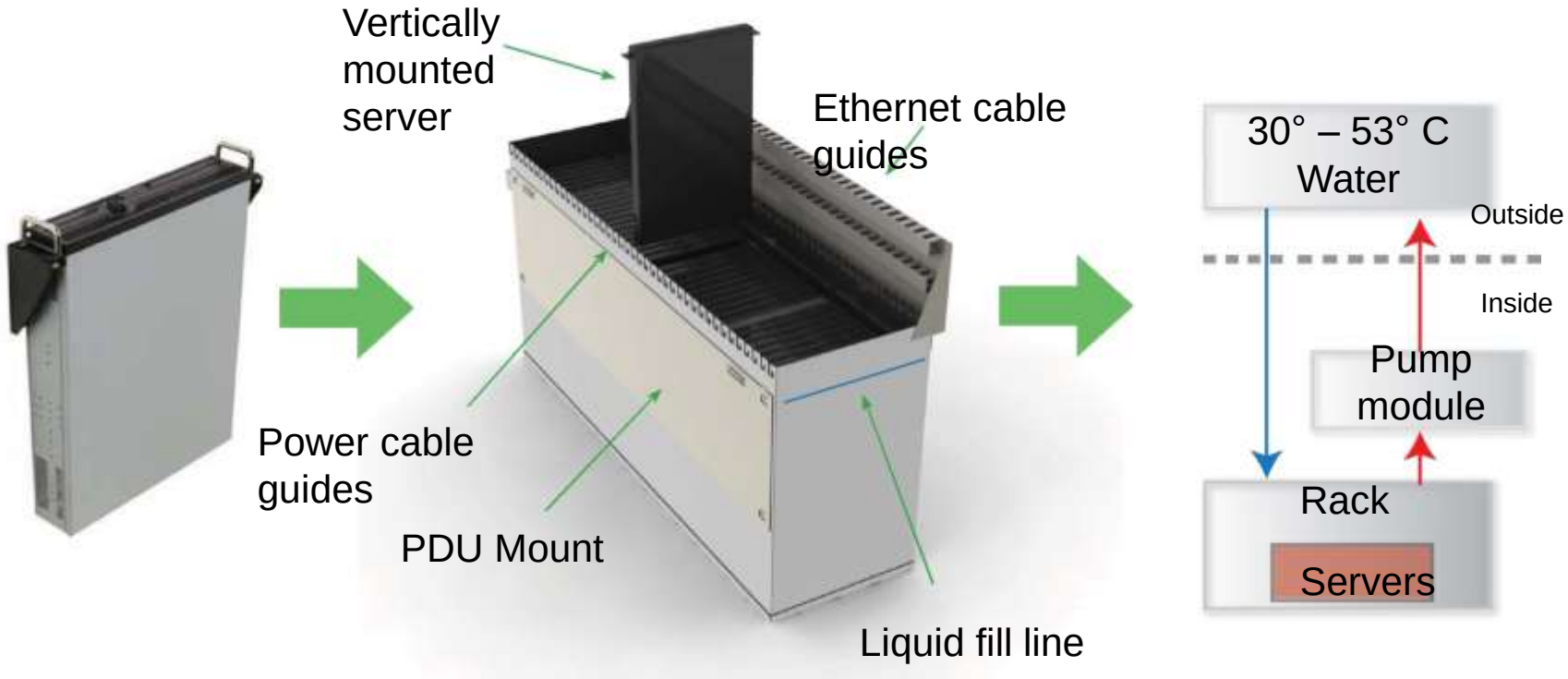
Reengineered Palm Oil as Coolant

Physical Setup

Any Vendor Server

42U Rack

Heat Flow



Install any standard rack server

» CPU and GPU compatible
» Fiber and/or copper

Submerge into coolant liquid

» Captures 100% of heat
» No air cooling

Intelligent control system

» Heat expelled externally
» Alerts/monitoring software

Eco2 vs Traditional

	AIR COOLING	Eco^2
CRAC/CRAH	REQUIRED	NOT REQUIRED
CHILLER	REQUIRED	NOT REQUIRED
LARGE BACKUP GENERATOR	FULL SIZE	HALF SIZE
AIR FLOW ENGINEERING	REQUIRED	NOT REQUIRED
HOT/COLD AISLE	REQUIRED	NOT REQUIRED
RAISED FLOOR/SPECIAL FLOOR	REQUIRED	NOT REQUIRED
RACK RAILS	REQUIRED	NOT REQUIRED

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Thank You!

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