

Final Agenda

“Economic Recovery through Energy Efficiency”

APEC Expert Group on Energy Efficiency and Conservation Meeting (EGEE&C) 55th meeting

Location: (virtual/online) Hong Kong, China

Date: November 18, 2020

Time: 09:00 – 11:00 and 15:00 – 17:00
(Hong Kong, China time – GMT+8)

Part 1 - Energy Efficiency Programs and its Role in Supporting Economic Growth (Theme – Energy Sectors)

Morning Session / 09:00 – 11:00

09:00 to 09:05	Introduction by Moderator (Tali Trigg)
09:05 to 09:10	Opening Remarks by Kei Ming Barry Chu, Assistant Director, Electrical and Mechanical Services Department, Hong Kong, China
09:10 to 09:15	(virtual) Group photo [poll question #1]
09:15 to 09:20	Energy Efficiency Context by APERC (Hugh Marshall-Tate)
	Keynote Address:
09:20 to 09:35	<i>“The Role of Industrial Energy Efficiency in Economic Recovery and Green Growth”</i>
	Hiroyuki Tezuka, Fellow, JFE Steel Corporation
09:35 to 09:45	Q&A from participants
	Examples of successful programmes from that delivered tangible energy efficiency and economic benefits (5 minutes per sector):
09:45 to 10:00	<ul style="list-style-type: none">• Peter Graham, Executive Director, Global Buildings Performance Network• Nuwong Chollacoop, Renewable Energy and Energy Efficiency Research Team Leader, ENTEC, Thailand• Steve Heinen, Manager of Energy System Analytics, Vector, New Zealand
10:00 to 10:20	Moderated discussion between the four presenters [poll question #2]
10:20 to 10:50	Q&A from participants
10:50 to 11:00	Summary by Moderator [poll question #3]

Part 2 - Energy Efficiency Programs and its Role in Supporting Economic Growth (Theme – Evaluating Energy Efficiency Programmes)

Afternoon Session / 15:00 – 17:00

15:00 to 15:10

Introduction by Moderator (Tali Trigg)

	(virtual) Group photo [poll question #1]
15:10 to 15:15	Energy Efficiency Context by APERC (Hugh Marshall-Tate)
	Keynote Address:
15:15 to 15:30	<i>“Recover Better with Sustainable Energy in Southeast Asia: A Case for Energy Efficiency”</i>
	Presentation of recently released Sustainable Energy for All (SEforALL) report by Alvin Jose, Senior Energy Specialist
15:30 to 15:40	Q&A from participants
	Examples of successful programmes from that delivered tangible energy efficiency and economic benefits (5 minutes per speaker):
15:40 to 15:55	<ul style="list-style-type: none"> • Nurzat Myrsalieva, Coordinator of Industrial Energy Accelerator at United Nations Industrial Development Organization (UNIDO) • Alexander Mastrovito, Head of Sustainability Asia-Pacific, Scania • Nina Campbell, Energy Efficiency & Conservation Authority (EECA), New Zealand
15:55 to 16:15	Moderated discussion between the four presenters [poll question #2]
16:15 to 16:45	Q&A from participants
16:45 to 17:00	Summary by Moderator [poll question #3] Closing Remarks by EGEE&C Chair Ek Chin Vy

Energy efficiency policy workshop

Economic recovery through energy efficiency

Hong Kong, China. 18 November 2020

Hugh MASHALL-TATE Researcher, APERC

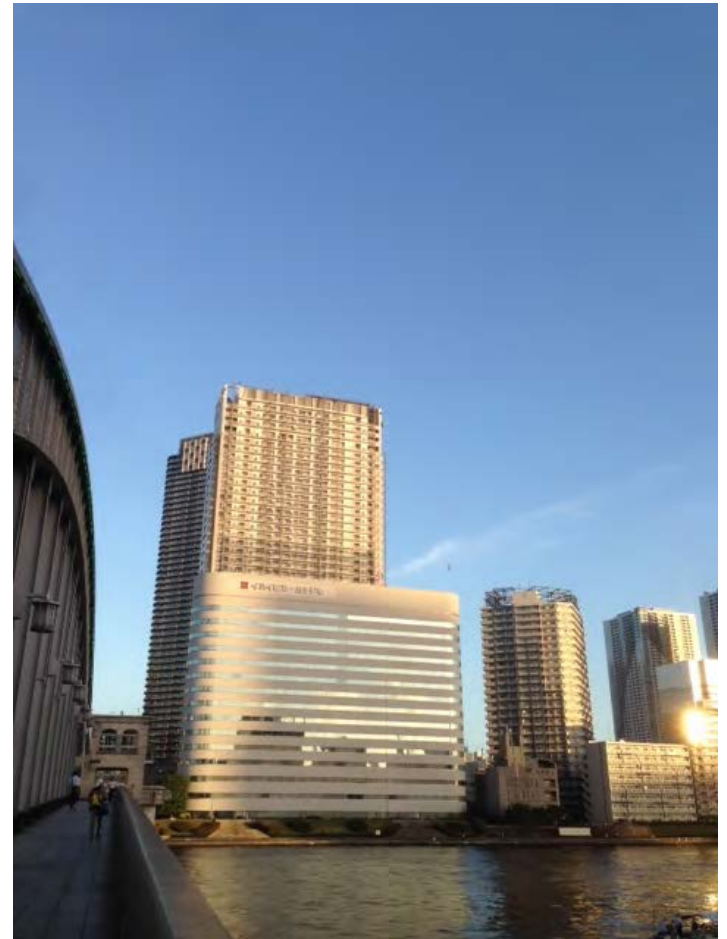


APERC was established in Tokyo in 1996 after the Osaka APEC leaders meeting in 1995.

Primary objective is to foster a common understanding of energy challenges facing APEC member economies.

Through analysis of:

- The supply and demand outlook.
- Energy markets.
- Policy responses.



Peer Review on Energy Efficiency

- Initiated by APEC Energy Ministers' 2007 Darwin Declaration.
- Broad review of energy efficiency policies of a volunteer APEC economy carried out by a Review Team of experts to provide recommendations on potential improvements.
- Contributes towards and achieving the shared Apec energy intensity reduction goal of 45% by 2035
- PREE has been hosted by 11 economies:
 - Chile, New Zealand, Viet Nam, Thailand, Chinese Taipei, Peru, Malaysia, Indonesia, The Philippines, Brunei Darussalam and Mexico.
- Follow-up PREE hosted by five economies:
 - Viet Nam, The Philippines, Thailand, Malaysia and Peru.

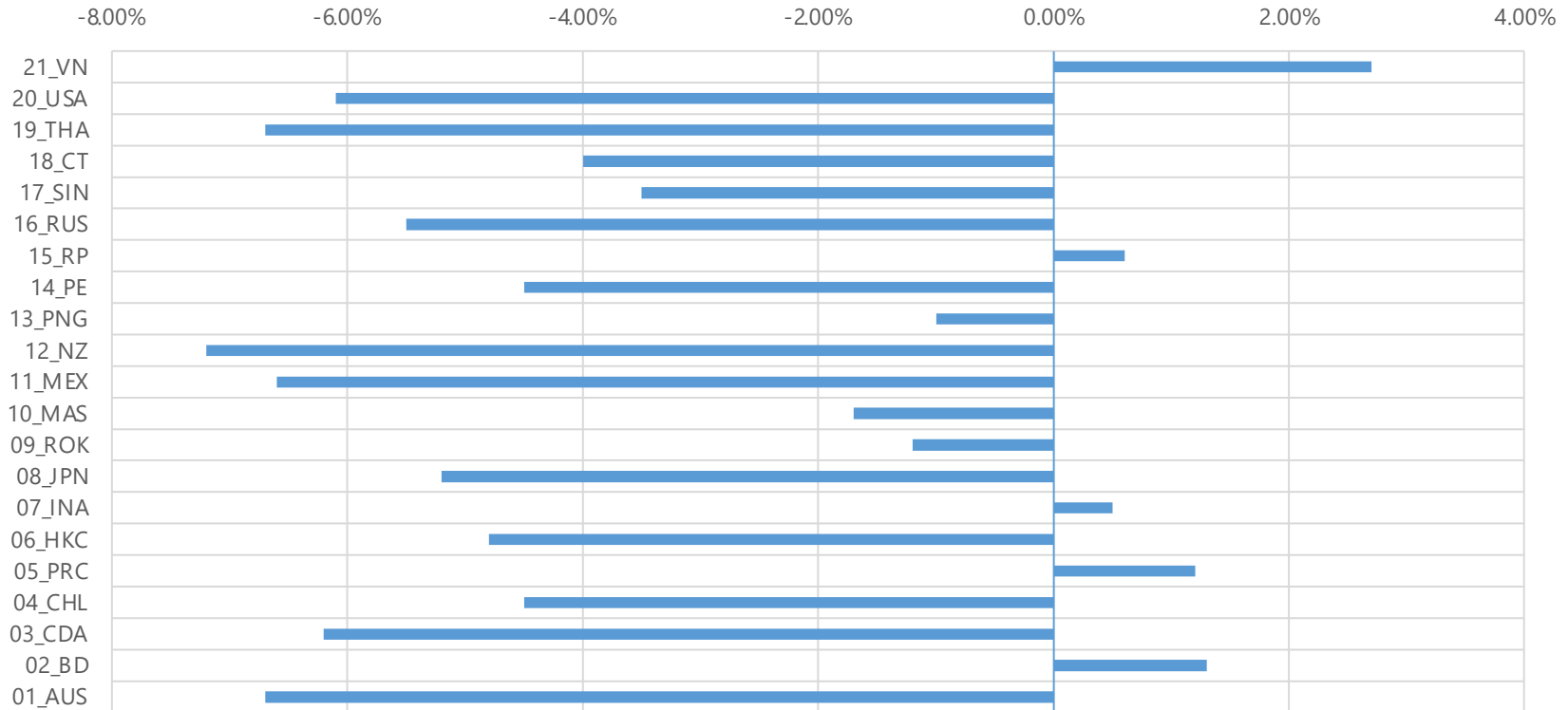
Energy Efficiency Policy Workshop

- Part of the APEC peer review on energy efficiency program
- Held in conjunction with EGEEEC every year
- Designed to share PREE outcomes with a wider array of stakeholders
- Previous topics have included
 - Government and donor funding mechanisms
 - Policy and program evaluation
 - Conformity Assessment
 - Fuel Economy Regulations



“Economic Recovery through Energy Efficiency”

Projected GDP for 2020 (IMF April 2020)



The International Monetary Fund projects that APEC members' gross domestic products (GDP) will shrink by an of average 3.2% in 2020

Energy Sectors

- 1. Industry**
- 2. Buildings**
- 3. Transport**
- 4. Power**

Evaluation

1. We are able to benchmark progress by following up previous PREEs.
2. Facilitates interagency communication by bringing all stakeholders together.
3. A focus on data.



Thank you

<https://aperc.or.jp/publications/reports/pree.php>



Asia-Pacific
Economic Cooperation

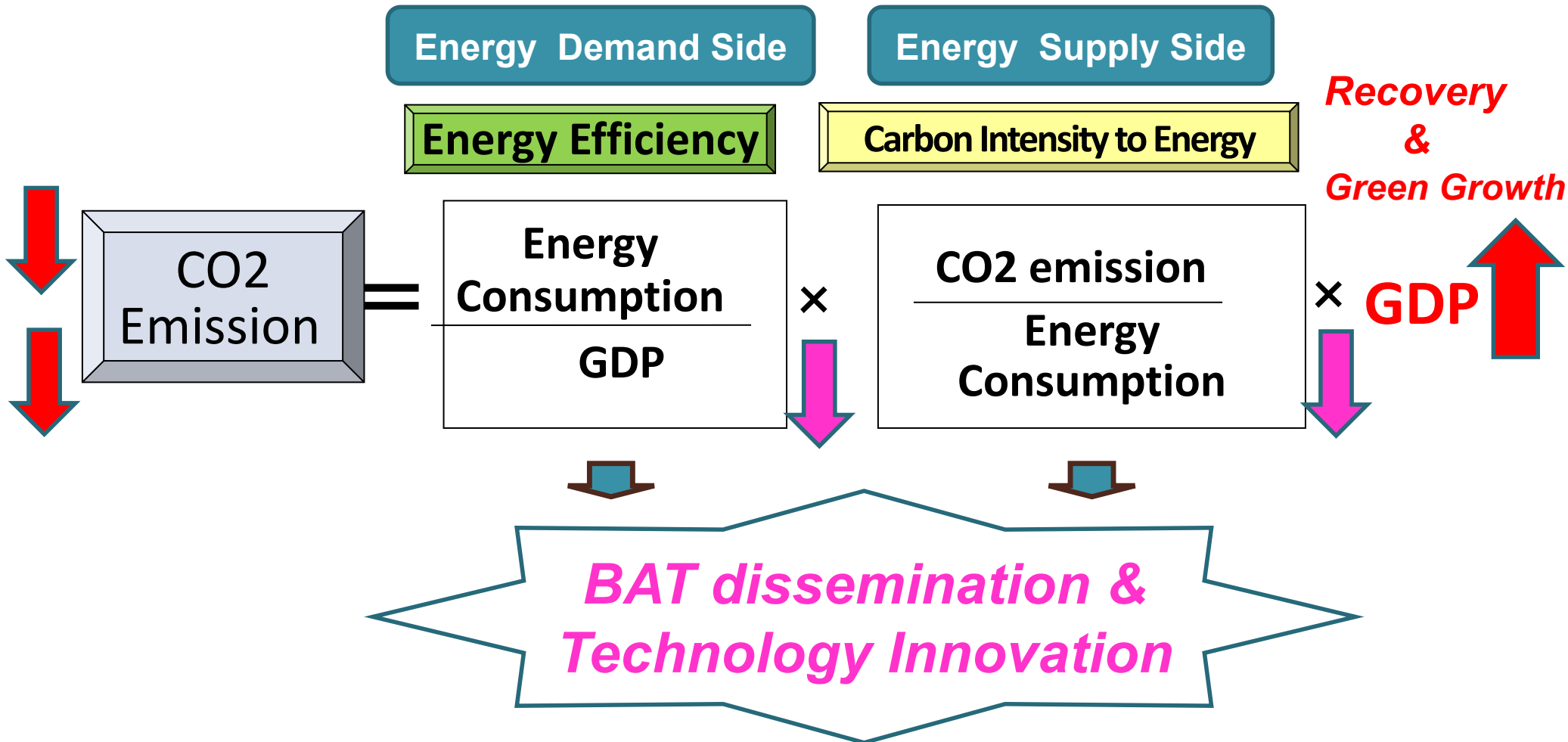


The Role of Industrial Energy Efficiency in Economic Recovery & Green Growth

Hiroyuki Tezuka
Fellow
JFE Steel Corporation

Kaya-Identity

➤ Technological solution is the key to reconcile economic recovery and emission reduction (Green Growth).



JISF's International Corporation on EE

Partner

China
(2005~)



India
(2011~)



ASEAN
(2014~)

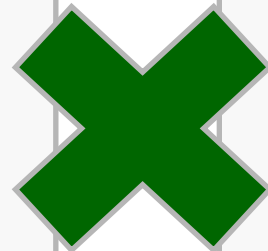


Cooperation Program

Steel
Plant
Diagnosis

Technologies
Customized
List

Public and
Private
Meeting



The Public & Private Collaborative Meeting btwn Indian & Japanese Steel Industry



Public and
Private
Partnership

India

Public members and observers

Ministry of Steel
Bureau of Energy Efficiency etc.

Private members and observers

Indian steel companies
(SAIL, RINL, TSL, JSW, JSPL,
BSPL, BSL, Essar, MECON etc.)

Japan

Public members

Ministry of Economy, Trade and Industry
Note: Following organizations attend the
meeting with specific theme
NEDO / JBIC / JETRO

Private members and observers

The Japan Iron and Steel Federation
(Nippon Steel, JFE steel, Kobe steel,
Nisshin Steel etc.)

Technology Customized List



1. The benefit of technology implementation is demonstrated

- *Indicate **CO₂ reduction effect and payback period** for the collaborative country or region, based on country-based energy prices, plant installation cost and CO₂ emission factor*

2. Technologies listed on TCL are **reliable**

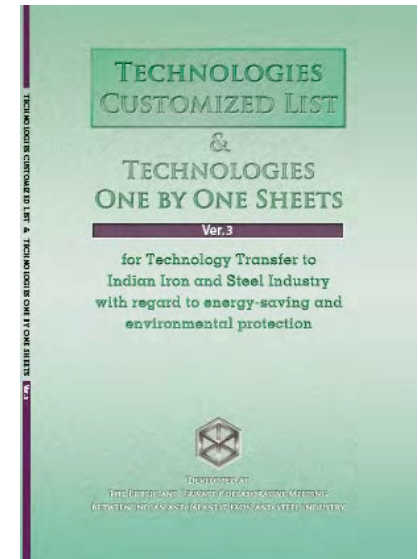
- *Effects of the technologies are **proven** through Japanese steelmakers' operating experiences*

3. Easy to reach out to further information when necessary

- *Include in contact detail of supplier companies which have the best available technologies*

Please find latest TCL from the link below (For India and ASEAN)

<http://www.jisf.or.jp/en/activity/climate/Technologies/index.html>



Benchmarking Energy Consumption & GHG Emissions of Iron & Steel Industries of Thailand



Climate Technology Centre & Network (CTCN) Project (2017)

- 1. Understand the baseline performance:** Designing specific questionnaires for different segments of Thailand iron & steel industry
- 2. Detailed survey:** Undertaking Field Survey and Off-site Survey on energy consumption data
- 3. Benchmarking of energy consumption pattern, together with**
 - Energy Reporting Guidelines and Energy Efficiency Manual
 - Assessment of Financing Options
 - Training for Iron and Steel Institute of Thailand for data collection & analysis



Now the Thai steel industry conducts benchmarking once every two years, based on the energy/CO₂ benchmarking system developed under CTCN project

JFE Group's Medium-to-long-term vision



【JFE Group's targets for reducing CO₂ emissions】

Toward 2030

- In the steel business, which accounts for most of the JFE Group's CO₂ emissions, we are exploring feasible scenarios with the aim of **reducing CO₂ emissions in fiscal 2030 by 20% or more compared to fiscal 2013**, maximizing the use of the **best available technologies and innovations**.

Toward 2050

- In line with the social transformation to establish carbon-free infrastructure over the long term, JFE will strive to be **carbon neutral within the JFE Group as soon as possible after 2050**.
- JFE is carrying out **research and development** to be **ready to show a lineup of carbon neutral technologies** in its business processes well ahead of 2050.

Key Messages

- **Energy Efficiency improvement** is the key for post COVID19 Economic Recovery to be matched with Green Growth
- **Applying BATs** is the most proven/effective/quick approach
- **International Corporation** under Public Private Partnership can play an important role
- In the long-term, **Technology Development and Innovation** is necessary to expand the pool of BATs

Thank you

**Buildings Sector:
Supporting Economic Recovery through Energy Efficiency**

APEC Expert Group on Energy Efficiency and Conservation Meeting
18th November 2020

Dr. Peter Graham Executive Director, GBPN



Kampung Admiralty – Singapore, WOHA Architects

Key Points

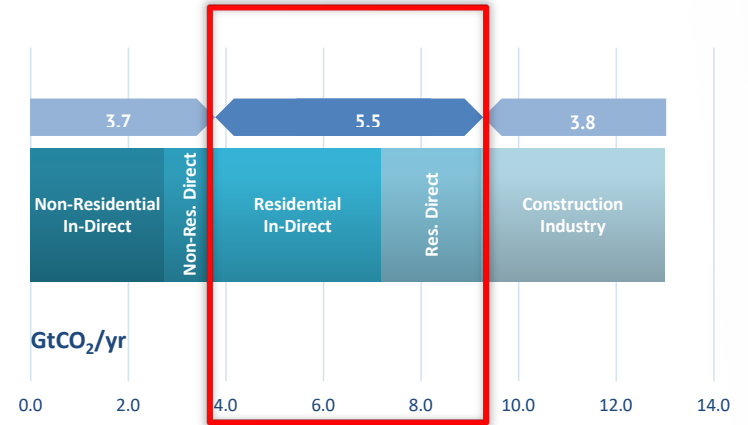
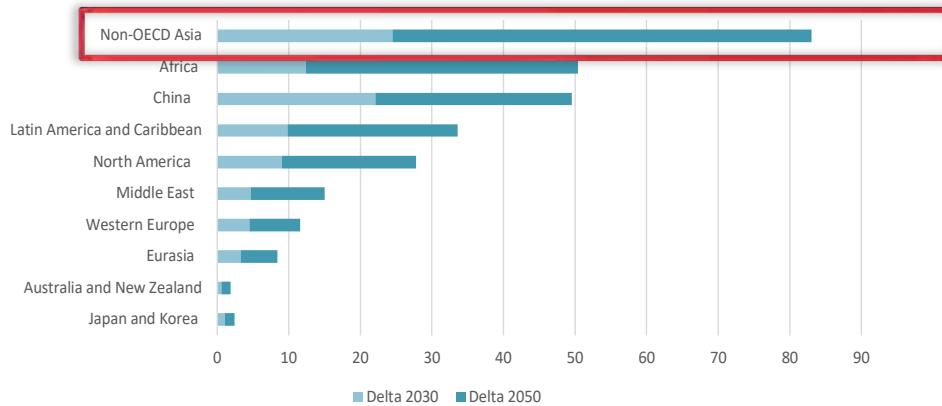
CONTEXT: APEC & ASEAN Aggregate Buildings Efficiency & Economic Benefits are Globally Significant

POLICIES WORK: Evidence shows that Ambitious Policy Settings Support Economic Recovery

CHALLENGES & OPPORTUNITIES: Can be aggregated across APEC & ASEAN with common approaches.

CONTEXT

Key Priority: Decarbonizing Housing in Non-OECD Asia



Source: GABC, 2018

POLICIES WORK

Policy works - Post Covid 19 Economic Recovery

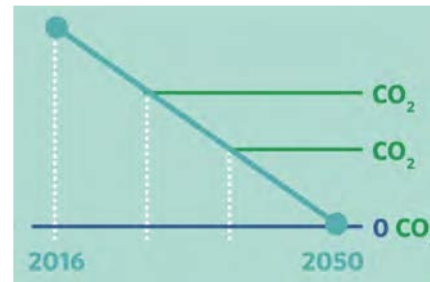
Non-Climate Drivers



Ambitious Building Codes + Rating & Disclosure + Appliance Standards & EEOs

Integrated Policy Packages

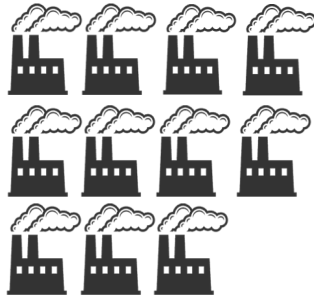
Performance & Renovation targets



Benefits of Energy Efficiency Codes

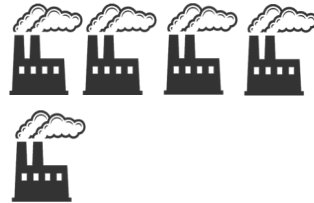
EU

Saved 35 – 45MtCO₂
2010-2011



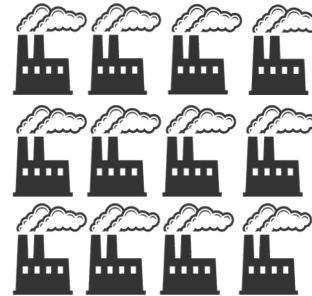
US

Saved 106 Million toe
1992-2012



CHINA

Beijing Saved 1585Mtce
2011-2015



UGANDA

Uganda BEE Policies
Electricity for
8 Million People



Benefits of Renovation Policies



Set targets & obligations

EU

20% improvement: **+€33.8bn GDP** by 2020; **Deep renovation**: > **€1300bn +1.1M jobs** by 2050.

Apply the energy code

China

~ **150Mtce** reduced By applying the energy code to renovation in Beijing

Provide grants for deeper renovation

Germany

KfW Grants **+8450 jobs**: accrued benefit of **€10 billion** (2007-2012)

Mandate rating & disclosure

Australia

NABERS: **saved 35% energy & 42% in emissions** since 2000.

Price carbon emissions

Japan

Tokyo Cap & Trade reduced emissions by **14MtCO₂** (2010-2014)

Economic Benefits



GDP + Policy ambition leads to +ve ROI to Public Finances over time.. (e.g. direct and co-benefits of energy efficiency measures have the potential to add **1% growth in GDP in Germany**).



Higher performance leads to **lower home operating costs**. (e.g. EE measures to eliminate fuel poverty in 2.5 million homes in the UK provided a **net economic benefit of UK1.2Bn in 2008**)



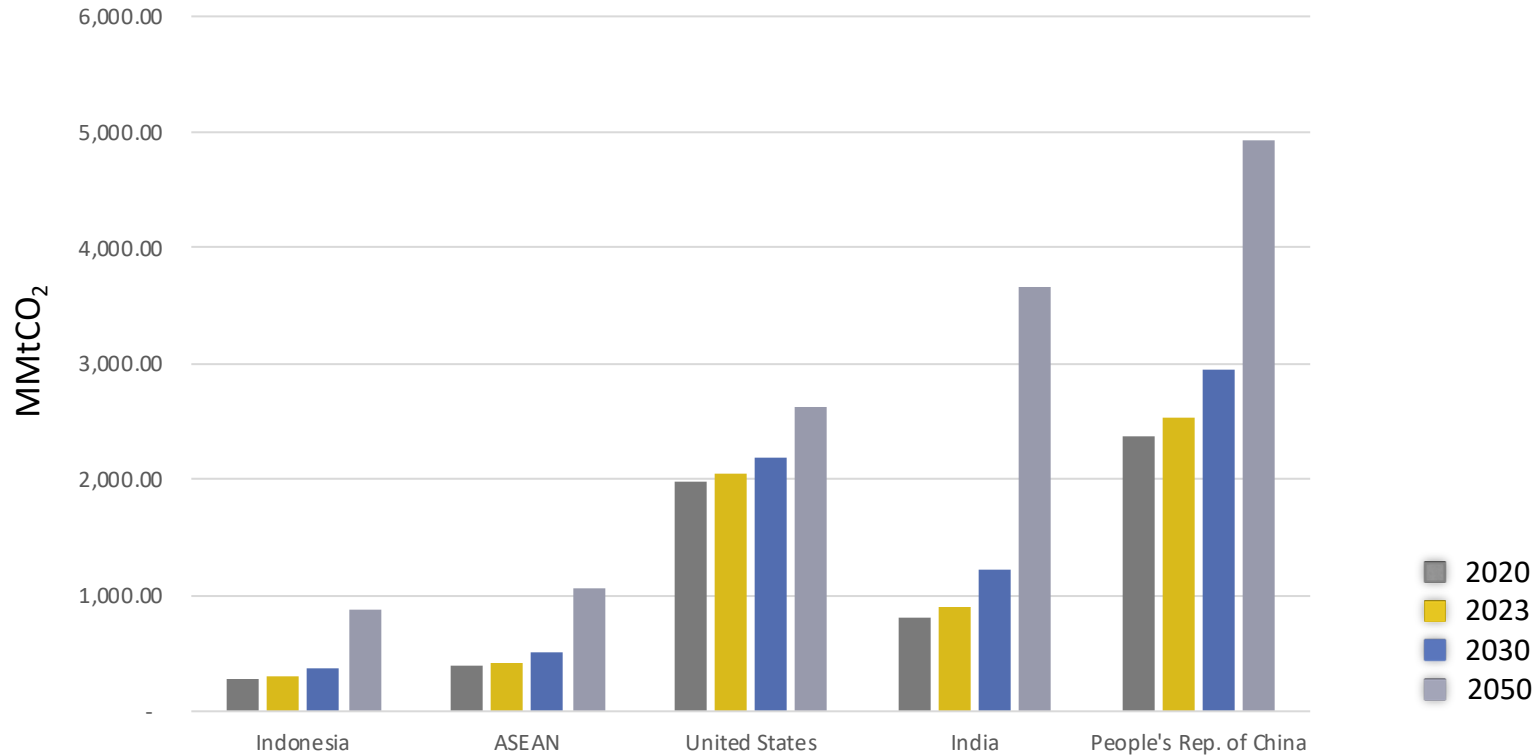
Each **US\$1M invested in EEBs** creates about **14 job-years** of net employment. **Productivity of the construction value chain also improves.**



Direct health benefits are between **8%-22% of value of energy savings** (e.g. In EU up to EU2.86Bn health savings by 2020; Indirect benefits include better physical & mental health. **Improving thermal comfort in homes is a priority.**

CHALLENGES & OPPORTUNITIES

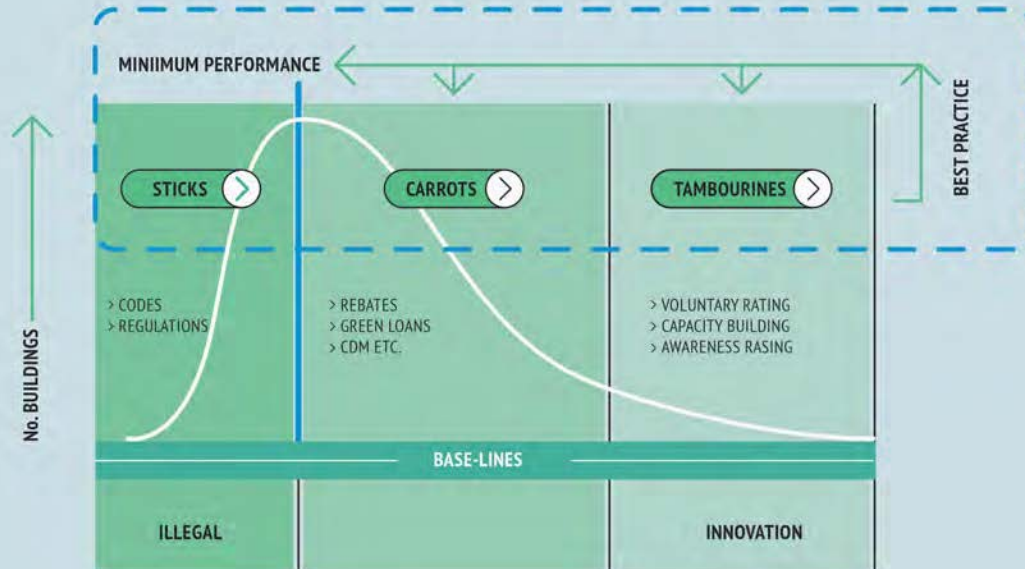
Aggregating Buildings Sector Emissions



Policy Strategy

HOW CODES ENABLE MARKET TRANSFORMATION

Learning from Local experience and best practices

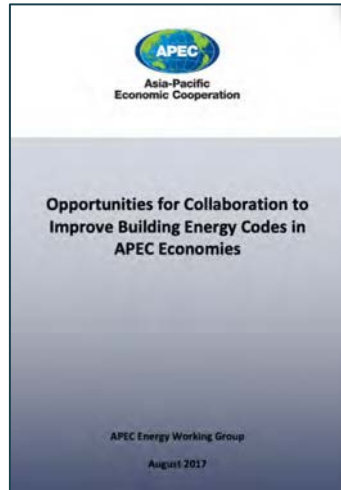


Supporting Regulatory Reform + Driving Demand...Health, Jobs & Economic Opportunity in **local** housing markets



Code Implementation a Challenge

Building Codes & Standards
lack coverage & enforcement



But voluntary green building standards are commonly available ...

Comprehensive coverage	Addressed overall, unless more voluntary than mandatory measures are included
Progress towards good coverage	Addressed by most economies, unless more voluntary than mandatory measures are included
Significant gaps in coverage	Addressed by less than half of economies

	Australia	China	Indonesia	Malaysia	Philippines	Singapore	Thailand	Viet Nam
New commercial	•	•	e	•	e	•	•	e
Commercial renovation	•		•		•	•		•
New large residential	•	e	e	e	e	•	e	e
New Other (e.g. hotels)	•		e	•	e	•	e	•

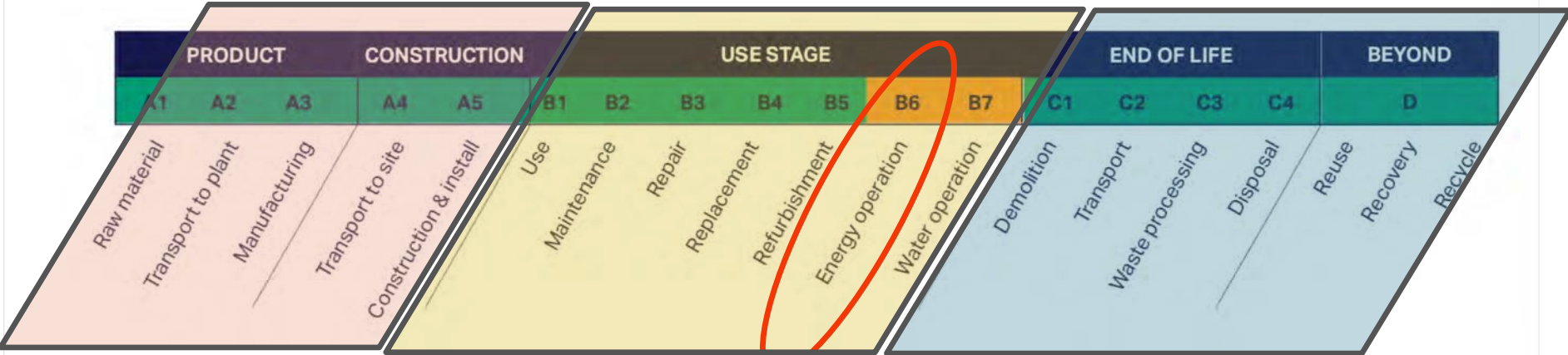
Small/Medium Residential
Industrial Buildings
Renovations
Existing Stock
Compliance & Enforcement
Zero Energy Targets
Regular Code Review & Updates

Common Standards

Include Embodied Emissions from Bricks, Cement & Steel

Increase scope of Policy Impact including refurbishment, rating & disclosure, Economic & Health Benefits

Promote Zero Life-cycle Emissions Building through design innovation



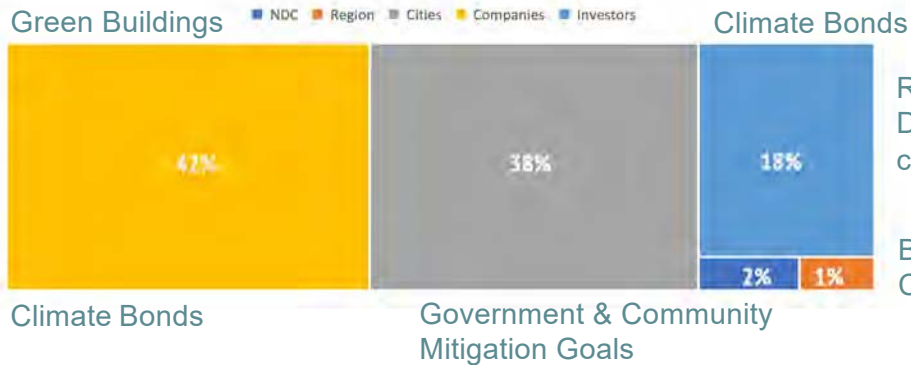
Materials Standards

Rating & Disclosure

Codes

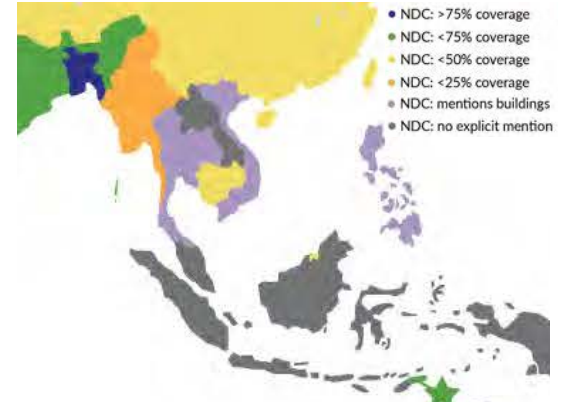
Low-Carbon Finance

Align with NDC Actions & Commitments

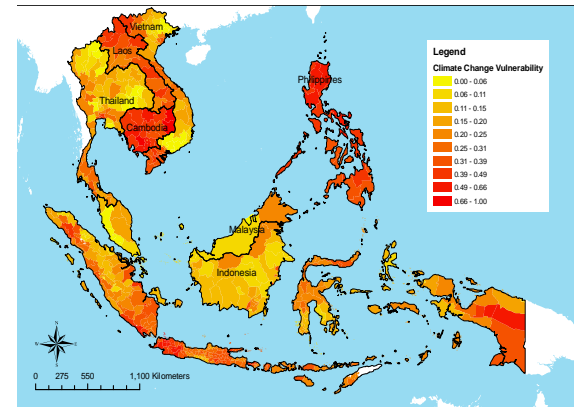


Roof-top PV &
Design for
climate

Building Codes &
Climate Policies



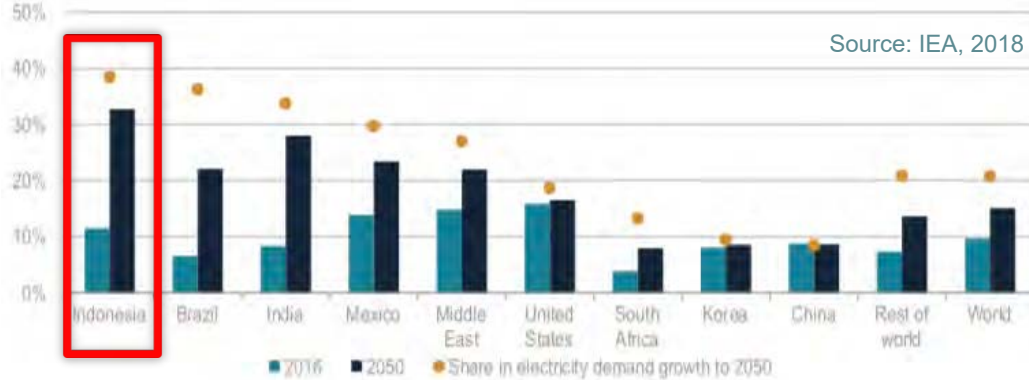
Align with Adaptation & Resilience – Buildings sector actions



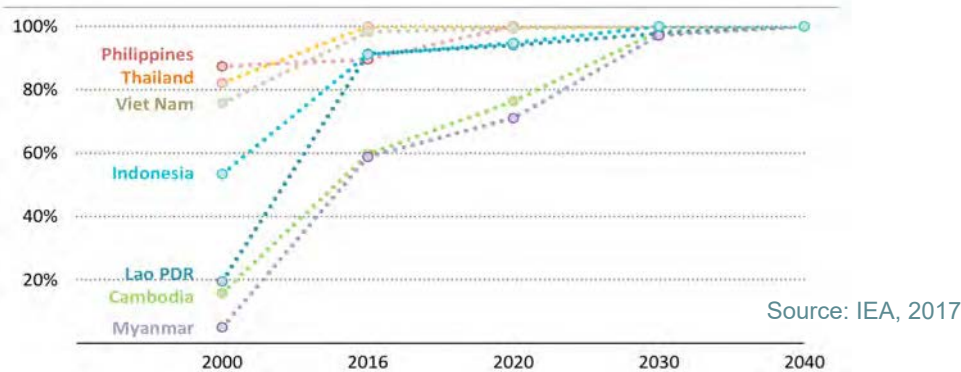
Source: Yusuf & Francisco, 2009

Adaptation Actions in the Building Sector among Asia-Pacific Nations in NDCs & NAPs

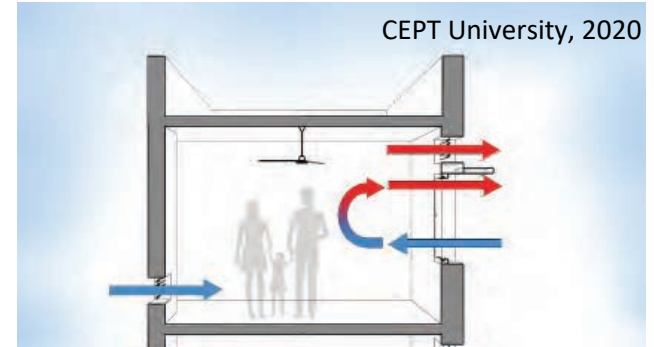
Electrification: Clean Energy or Emissions Driver



Indonesia #1 in Growth in cooling-related electricity demand



Thailand & Vietnam #1 & 2 in Growth Electrification



Passive & Adaptive Cooling



Integrated Renewables

Challenges & Opportunities

AGGREGATE APEC and ASEAN BENEFITS with:

- **COMMON** Goals and Performance Standards
- **COORDINATED** Stakeholder Engagement Process and platforms
- **INTEGRATED** Implementation between national, provincial and municipal governments + Private Sector and Community Engagement

Thankyou!

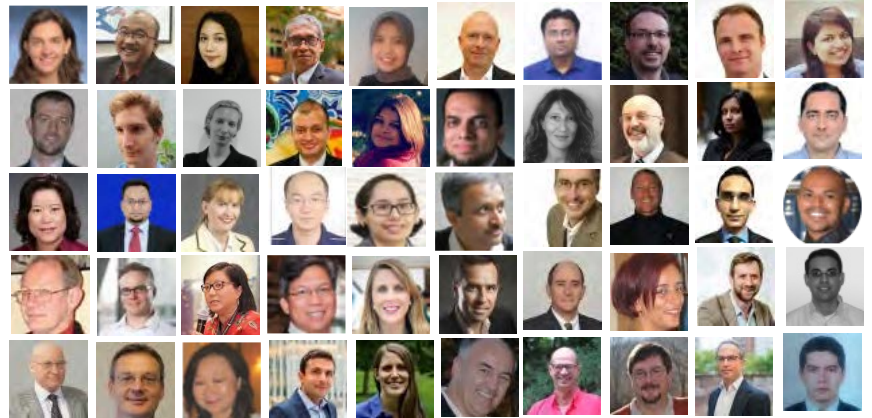
More information:

www.gbpn.org

Peter.Graham@gbpn.org

GBPN Community of Practice

+50 experts in 22 Countries



APEC	
Expert Group on Energy Efficiency and Conservation (EGEEC)	
Projects on buildings efficiency including topics: Cool roofs, APEC Nearly/Net Zero Building Roadmap	Link: www.apec.org/egeec/index
Asia-Pacific Building Codes Forum	
Opportunities for Collaboration to Improve Building Energy Codes	Link: www.apec.org/Publications/2017/10/Opportunities-for-Collaboration-to-Improve-Building-Energy-Codes-in-APEC-Economies
ASEAN	
ASEAN Centre for Energy (ACE)	
Insights and reports on Energy Efficiency & Conservation	Link: https://aseanenergy.org/how-do-asean-energy-efficiency-and-conservation-efforts-progress-in-the-first-quarter-of-2019/
ASEAN Climate Change and Energy Project (ACCEPT)	
Country snapshots & Policy Briefs	Link: https://accept.aseanenergy.org
ASEAN Building and Construction Working Group	
Identifies areas for harmonisation of standards, technical requirements, and supports cross-cutting initiatives such as smart cities.	Link: https://asean.org/storage/2020/08/ASEAN-for-Business-September-2019-Bimonthly-Bulletin.pdf (p4)
Global Buildings Performance Network	
Policy Strategy for Decarbonizing Buildings in Asia. Supporting Policy Planning, Adoption, Implementation and Capacity Building in S.E. Asia and India.	Link: https://www.gbpn.org/activities/south-east-asia
Global Alliance on Buildings & Construction	
Supporting development of regional sustainable buildings roadmaps.	Link: https://globalabc.org

Examples of successful programs from that delivered tangible energy efficiency and economic benefits: Transport

APEC Energy Efficiency Policy Workshop [EWG 07 2019A]:
18 Nov 2020 [online]

Nuwong Chollacoop

Renewable Energy and Energy Efficiency Team Leader

National Energy Technology Center [ENTEC]

nuwong.cho@entec.or.th



New R&D Center focusing on Energy Technology after 1st October 2020



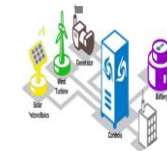
Renewable Energy



Energy Storage



Conventional Energy



System Integration & Energy Management



Energy Efficiency

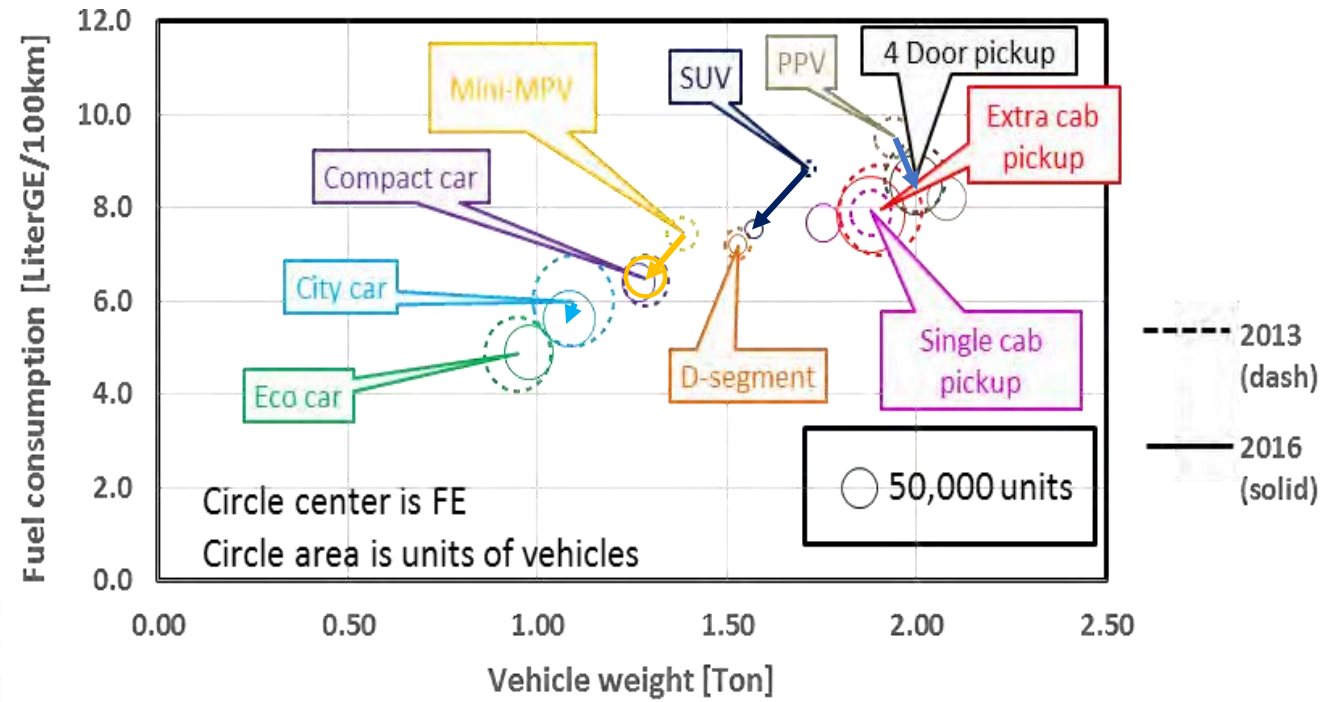


Past economic boost through EE in transport

- Eco-car phase I & II [5 & 4.2 Lge/100km fuel economy criteria]
 - ✓ First car scheme [reduced excise tax for first-time car buyer including eco-car]
- CO₂-based excise tax through eco-sticker program boost more EE car

Thailand: LV sales foreseen to fall to a decade-low volume

▪ Slowing economy, weak exports, high household debt and COVID-19 impact



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Source: LMC Automotive, GIZ

Dec 2012: Cabinet announced CO₂-based excise tax to be implemented on 1 Jan 2016

Current economic boost through EE in transport

- Electrified vehicle [BEV/PHEV/HEV, e2&3w]

Automotive manufacturers applying for BOI package to produce EV cars

HEV	TOYOTA	HONDA	NISSAN	MAZDA
PHEV	Mercedes-Benz	BMW	SAIC MOTOR	MITSUBISHI (tentative)
BEV	FOMM	MITSUBISHI (tentative)	NISSAN	TOYOTA (under study)

EXCISE TAX FOR ECO-CAR AND ELECTRIC VEHICLES

Vehicle type	CO2 emission (g/km)	Tax rate (effective from Sept 16, 2017)	Tax rate for BOI incentives (effective until 2025)
Eco-car One (2007)	Below 120	14%	N/A
Eco-car Two (2013)	Below 100	12%	N/A
	Below 100 with E85	10%	N/A
Hybrid and Plug-in Hybrid EV	Below 100	8%	4%
	101-150	16%	8%
	151-200	21%	10.5%
	Above 200	26%	13%
Battery EV	None	8%	2%*

Sources: Excise Department, Toyota Motor Thailand

*Battery EV tax during 2020-22 at 0%

ECO-CARS IN THAI MARKET IN 2017-18

Brand	2017	2018	% change	% share
Toyota	44,200	68,804	55.67%	32.84%
Mazda	51,760	45,972	-44.75%	21.94%
Nissan	33,673	42,205	25.34%	20.14%
Mitsubishi	22,833	25,784	12.92%	12.51%
Suzuki	21,300	24,625	15.61%	11.75%
Honda	2,473	2,132	-13.79%	1.02%
Total	156,239	209,522	34.10%	100.00%

BANGKOK POST GRAPHICS



LIST OF MANUFACTURERS GRANTED BOI'S EV INCENTIVES

Hybrid EV	Plug-in hybrid EV	Battery EV	Lithium-ion battery
<ul style="list-style-type: none"> Toyota (19.02 billion baht) Nissan (10.96 billion baht) Honda (5.82 billion baht) 	<ul style="list-style-type: none"> Mercedes-Benz (607 million baht) BMW Group (705 million baht) SAIC Motor-CP (1.36 billion baht) 	<ul style="list-style-type: none"> FOMM (716 million baht) 	<ul style="list-style-type: none"> Beta Energy Solution (1.1 billion baht) Thonburi Energy Storage Manufacturing (600 million baht) Energy Absolute (2 billion baht) Global Power Synergy (1.48 billion baht)

Tentative plans from manufacturers

Hybrid EV	Plug-in hybrid EV	Battery EV
<ul style="list-style-type: none"> Mazda Suzuki 	<ul style="list-style-type: none"> Mitsubishi 	<ul style="list-style-type: none"> Mine Mobility Research

Source: Board of Investment, compiled by Bangkok Post

Currently [August 2020]

20 companies participating in the labeling program

19 models / 11,750 cars of Electric Motorcycle Label no.5



Source: Bangkok Post, EGAT

Impact of COVID-19 on auto industry

- Recovery in progress through new business
 - ✓ Government procurement is the key

Figure 1 temporary shutdown during COVID-19 pandemic of global car manufacturers



Collected by Next Generation Automotive Research Center, Thailand Automotive Institute

Figure 2 Re-operation schedule of Thai car manufacturers.



Collected by Next Generation Automotive Research Center, Thailand Automotive Institute

Table 2 COVID-19 effect mitigation measures.

	Private sector	Government
Urgent Market Recovery Measures	<ul style="list-style-type: none"> - Online sale and marketing - New leasing service - Replacement parts manufacturing substitution plan 	<ul style="list-style-type: none"> - Market stimulate by old for new subsidy scheme - Low/Zero interest loan and a moratorium for SME - Establish a standard of replacement parts, R&D infrastructure and online marketing platform
Manufacturing Processes Improvement Measures	<ul style="list-style-type: none"> - Implement IoT together with robotic and automation - Risk management of parts purchasing - Operators' upskill and reskill for automation and next-generation manufacturing 	<ul style="list-style-type: none"> - Provide economy and infrastructure for the ease of implementing IoT - Low/Zero interest loan and CIT exemption from IoT adopting cost.
Sustainable Businesses And Products Development Measures	<ul style="list-style-type: none"> - Hygienic Vehicle 	<ul style="list-style-type: none"> - Promoting shared mobility business

APEC Workshop - 18th November 2020

Economic Recovery through Energy Efficiency

Dr Steve Heinen, Vector, New Zealand

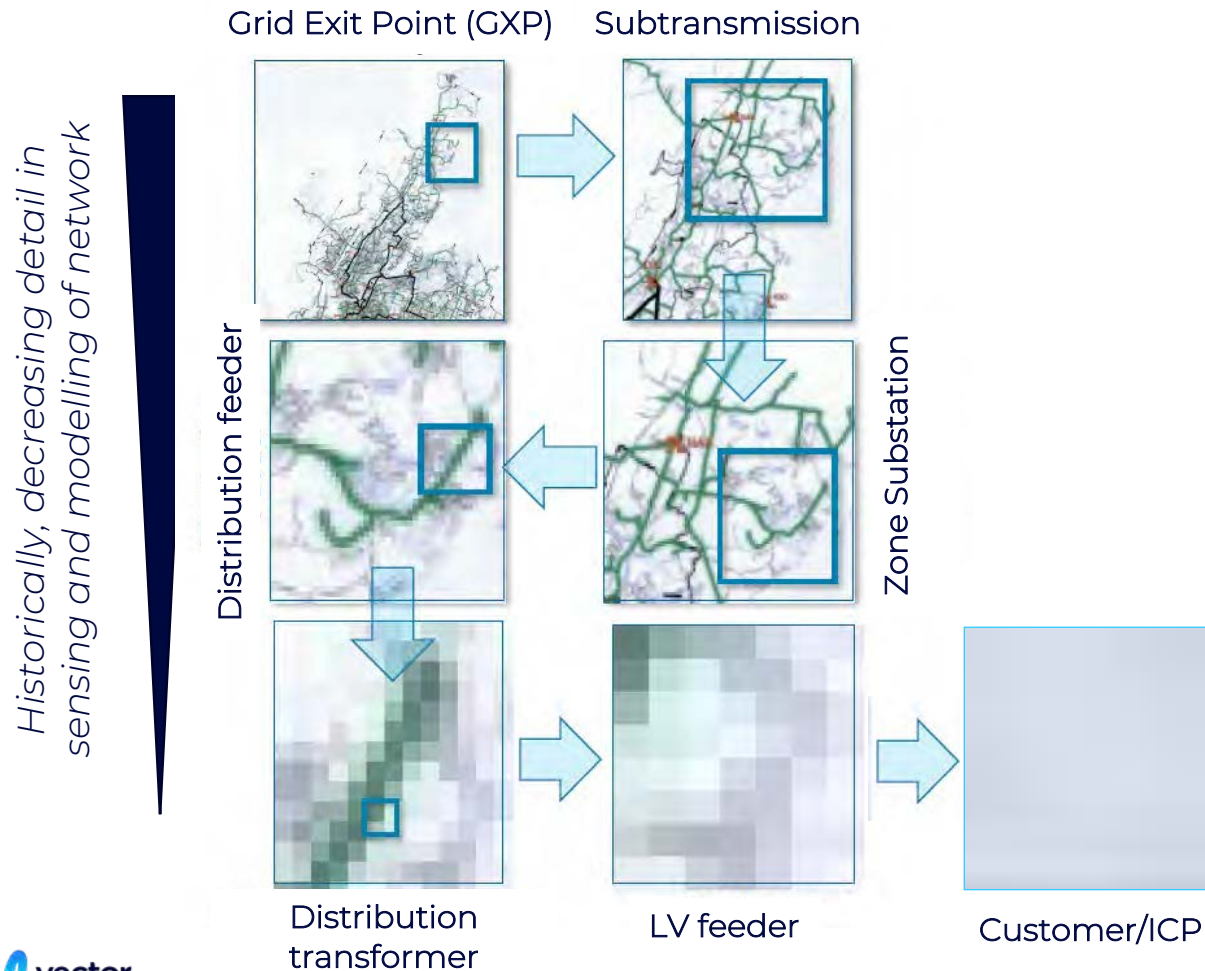


Vector Ltd is New Zealand's largest energy portfolio business

- Majority owned by our community via Entrust and operates in NZ, Australia and the Pacific
- Ownership model creates natural alignment between customer and shareholder benefits
- Listed on the New Zealand stock exchange, with a market capitalisation of \$4.4b



Customer-side transformation requires new modelling and analytics



Major trends are redefining the customer-side of the electricity system connected to LV networks:

- Energy efficiency (i.e. flat or decreasing demand growth)
- New technologies (EVs, solar PV, smart homes, heat pumps, etc.)
- Changing behaviour (e.g. environmental concern and decarbonisation)

The LV network and customer analysis have historically been modelled and monitored with less detail, but need to be incorporated in network planning to achieve better long-term outcomes for customers in terms of cost, efficiency and decarbonisation

Symphony Modelling Unleashes Customer-centricity



In an era of rapid technology and behaviour change, customer-centricity should guide electricity network strategy and planning.

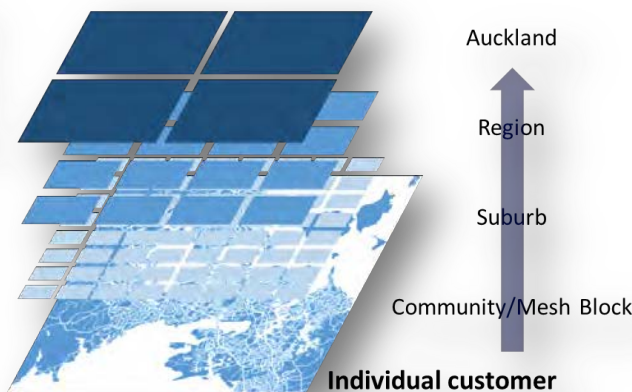


Vector's granular bottom up customer model enables a customer-centric and data-rich approach to planning and strategy

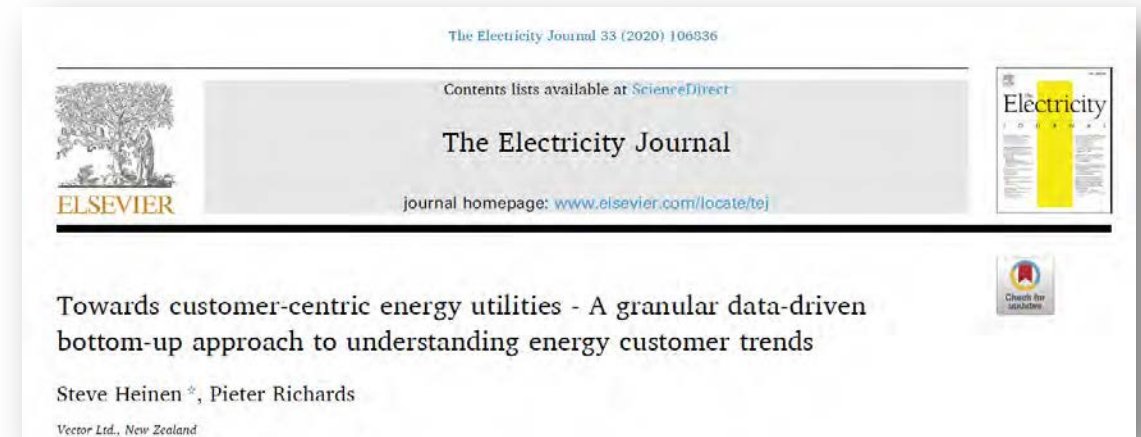


This delivers effective risk-based infrastructure planning, pricing and policies which recognise and account for diversity of customers and future uncertainty

GRANULAR
AUCKLAND
CUSTOMER
MODEL

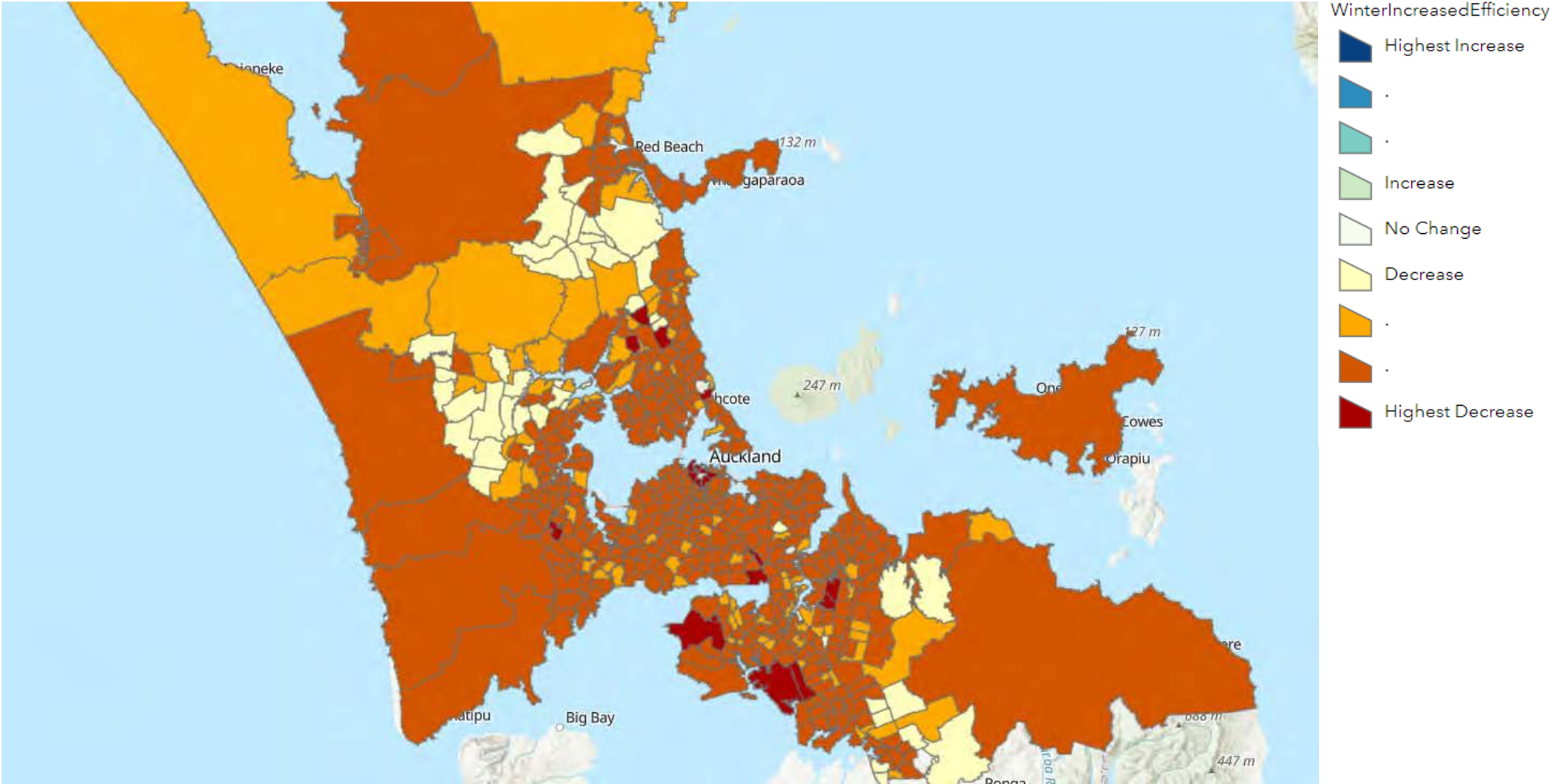


Vector's unique customer-centric modelling approach has been recognised internationally and recently published in 'The Electricity Journal'. The model was also nominated for network initiative of the year in the NZ Deloitte Energy Awards 2019



Free access until mid November with following link
<https://authors.elsevier.com/a/1bqoX3ic--3JFd>

Granular Residential Energy Efficiency Potential

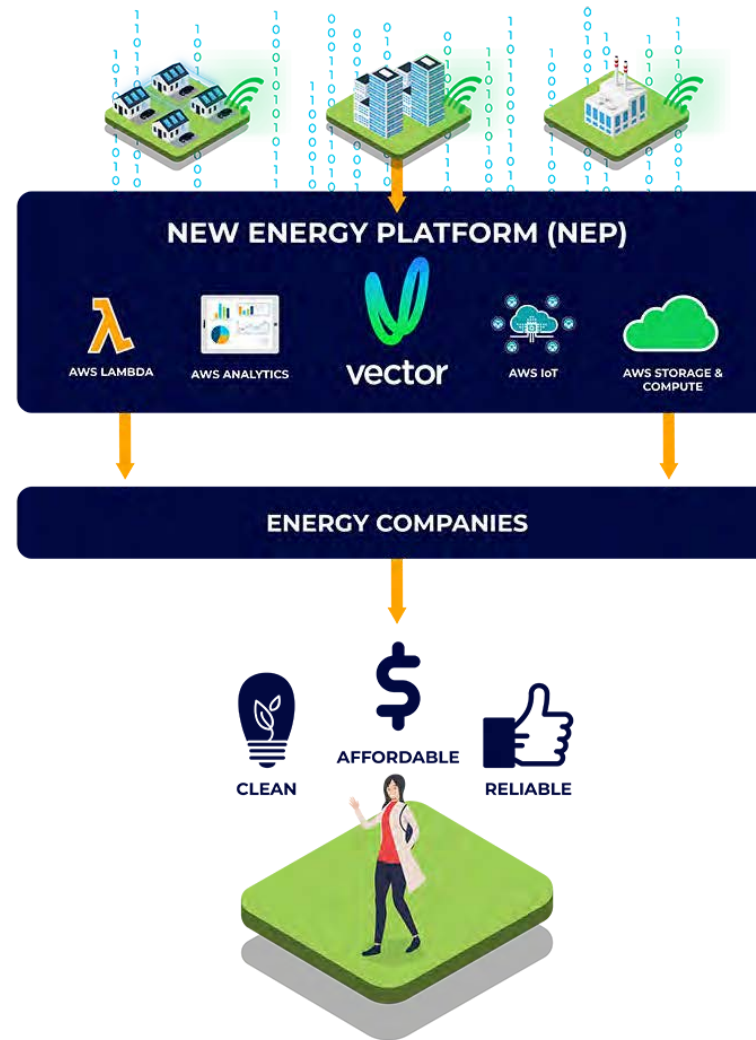


Each zone represent roughly 1000 homes

Vector AWS Strategic Alliance

New Energy Platform

Next generation advanced metering and market enablement platform



Key Messages



Network planning needs to be flipped to a **bottom-up approach** to put the customer at centre

Unprecedented energy efficiency success over last decade made that clear



Smart meter data is essential to understand changing demand side and provide new robust planning inputs



Non-wire alternatives and **DERMS are available** but need the right frameworks and tools



Recover Better with Sustainable Energy in Southeast Asia: A case for Energy Efficiency

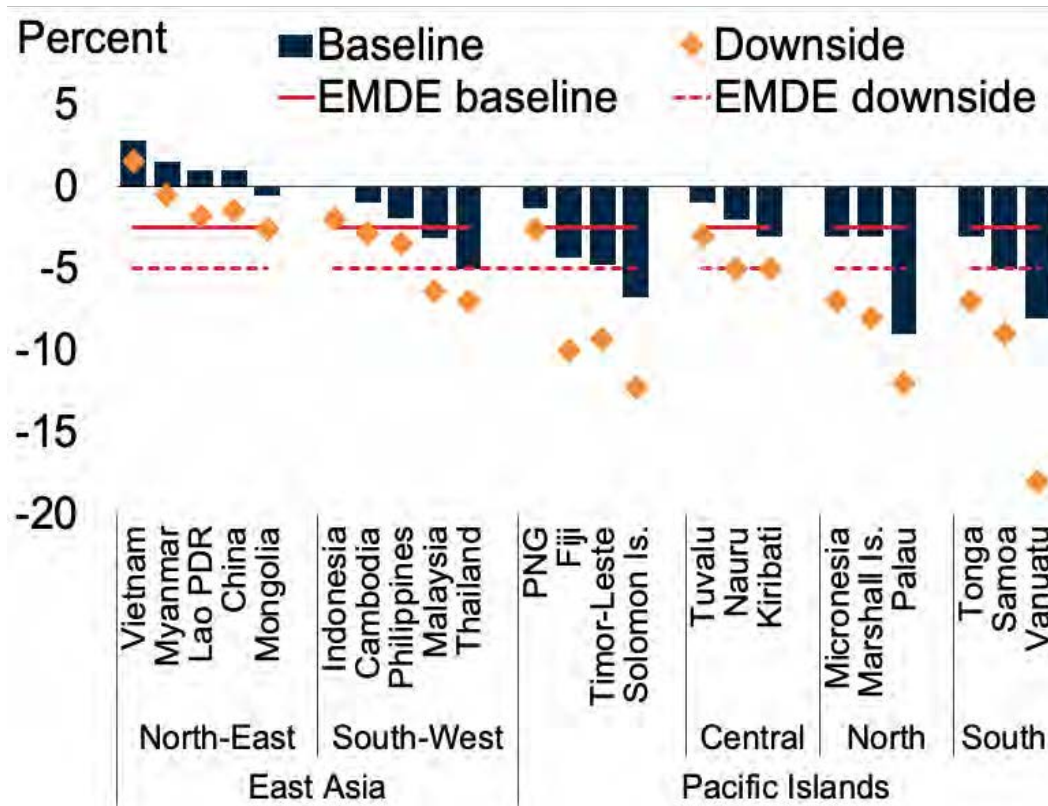
APEC Expert Group on Energy Efficiency and Conservation Meeting (EGEE&C) 55th meeting

Alvin Jose
Senior Energy Specialist
Sustainable Energy for All
18 October 2020



Covid-19 has put Global and Asian Economies into worst contraction ever

East Asia and Pacific 2020 Growth Forecast



- Per IMF, Growth in Asia is expected to stall in 2020, which is the worst performance in last 60 years.
- North East Asia, ASEAN and the Pacific economic growth is expected to be limited to 0.5%.
- Emerging Markets and Developing Economies (EMDE) in Asia would/will experience severe economic contraction, and countries depending on tourism , oil/energy exports, SMEs and deep global value chains would experience most impacts.
- EMDE's in Asia are also consumption heavy economies and slowdown in demand has resulted in reduced manufacturing activity and household incomes.

SDG-7 by 2030 Progress – Key trends

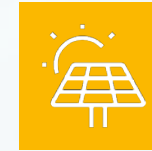
Tracking SDG7: The Energy Progress Report 2020



Covid-19 has impacted SDG-7 progress, but this is our reset moment. We can recover better.



We can no longer ignore the clean cooking crisis.



The renewable energy opportunity is still to be fully realized.



Energy inefficiency is costing us.



Electricity access is growing, but not for everyone.



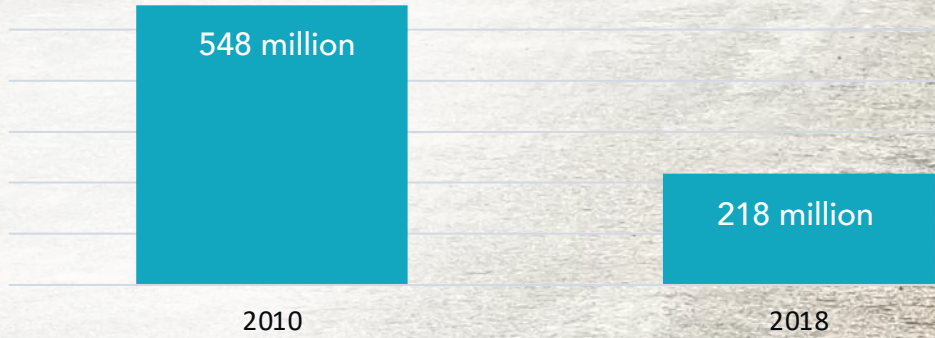


Southeast Asia has considerably improved access to electricity but there are ~789 million people in the world without access to electricity

Significant progress on electrification has been made since 2010, with the number of unelectrified people falling from 1.2 billion to 789 million in 2018.

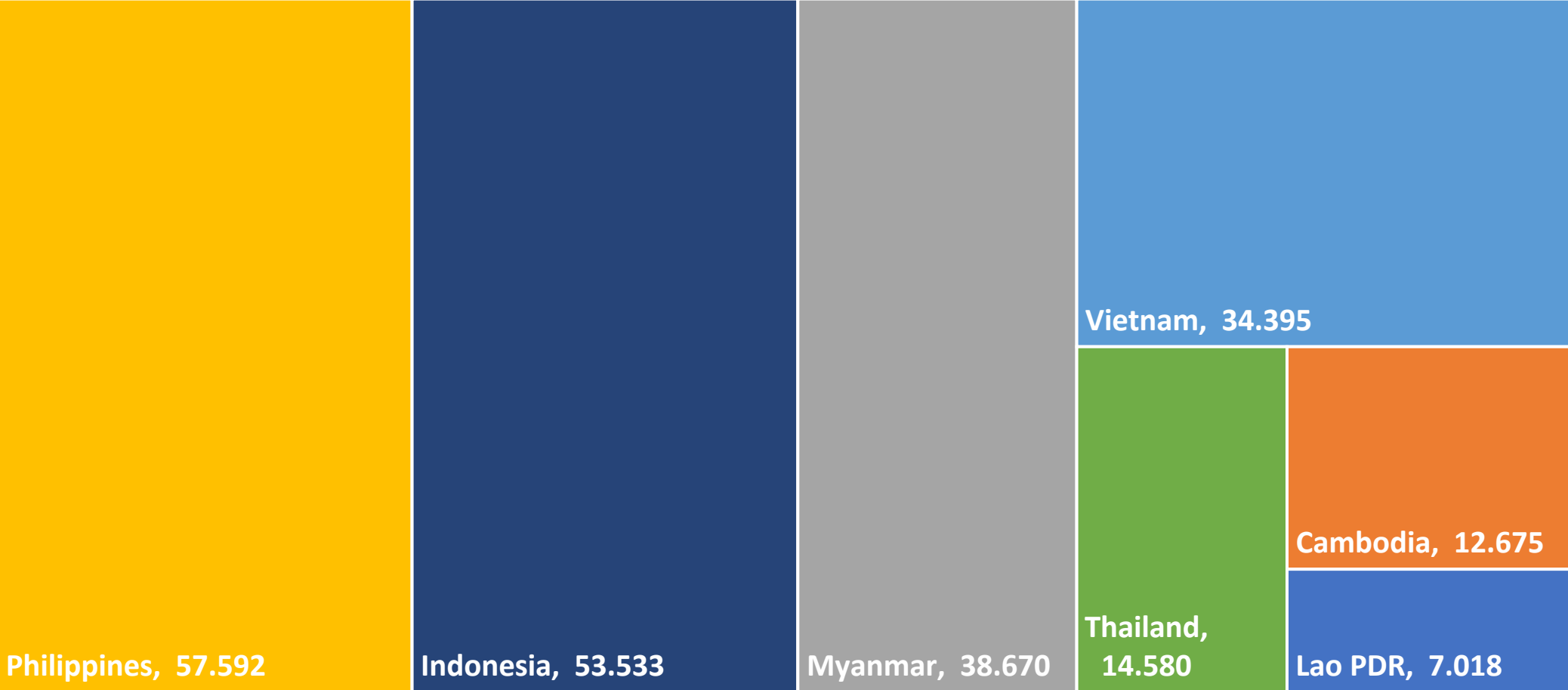


The decline was most significant in Asia, where the deficit shrank from 548 million in 2010 to 218 million in 2018, but in Africa the situation is basically stagnant.



Southeast Asia has made excellent strides in electricity access, however, there are ~218 million people without access to clean cooking

Population in Southeast Asian countries without access to clean cooking (million)

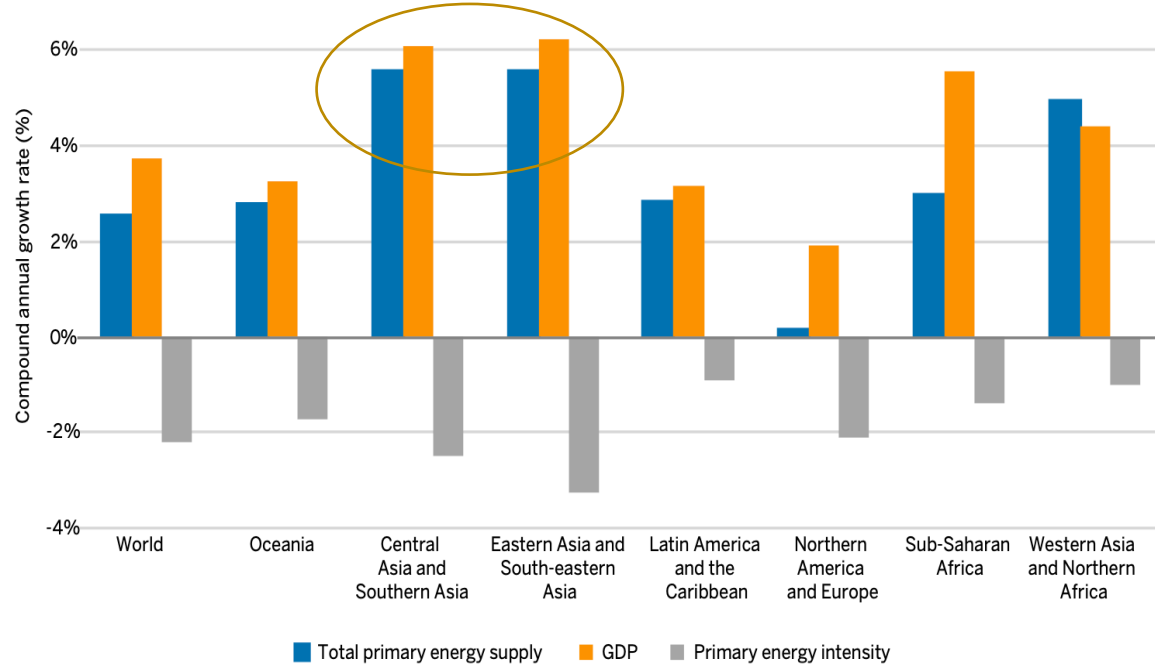


SOURCE: SDG-7 Tracking Report 2020. This graph shows only countries that have clean cooking access lower than 95%



Energy Efficiency is the “first” and “cheapest” fuel than needs to be capitalized in SE Asia

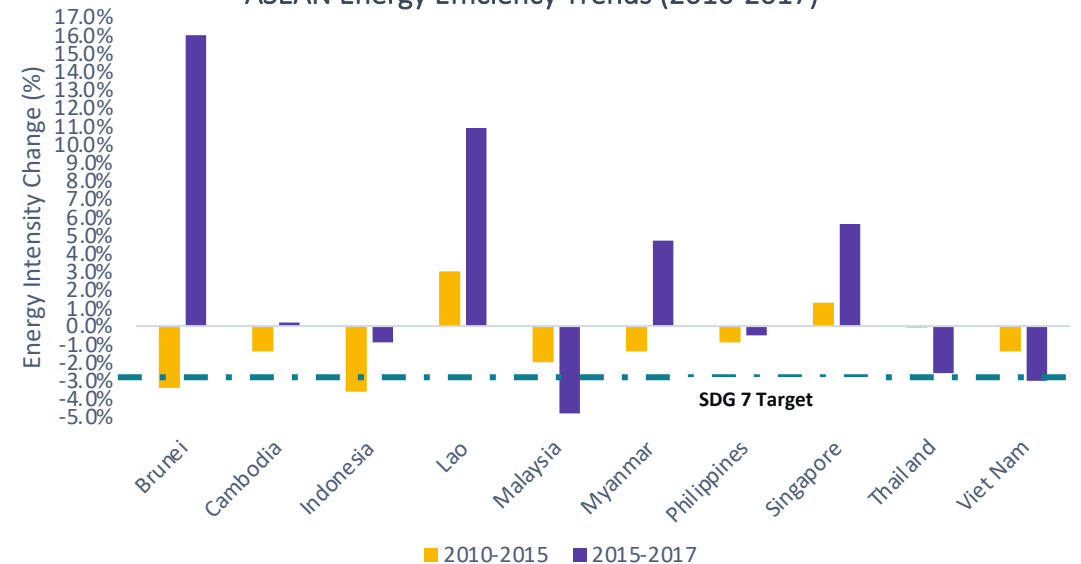
Asia has the fastest growing economy and energy demand in the world



- Asia is the global growth story with energy required to sustain its development efforts and meet its development potential
- Energy Efficiency is the cheapest fuel that can power businesses towards higher competitiveness and strengthen resilience.

- There is still a lot of untapped EE potential in Asia that remains to be unlocked.
- Malaysia, Thailand and Vietnam have sustained their progress, while Indonesia and Philippines have slowed their progress.
- Brunei, Lao PDR, Myanmar and Singapore have significantly increased their energy intensity.

ASEAN Energy Efficiency Trends (2010-2017)



Low Hanging Fruit: Sustainable Cooling provides significant opportunities for addressing Equity and Energy Efficiency in Asia

Cooling Access: Populations at Risk in Asia

Rural Poor: **Approximately 109 Million**

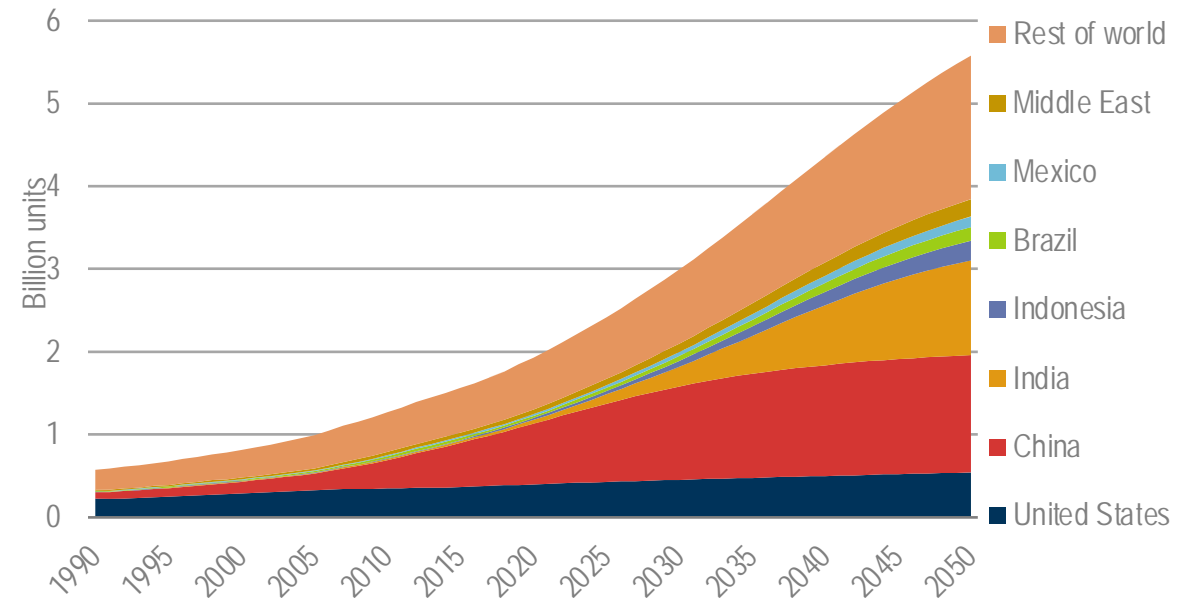
Urban Poor: **Approximately 484 Million**

Lower-middle Income: **Approximately 1.8 Billion**

Cooling Access issues for Health and Productivity

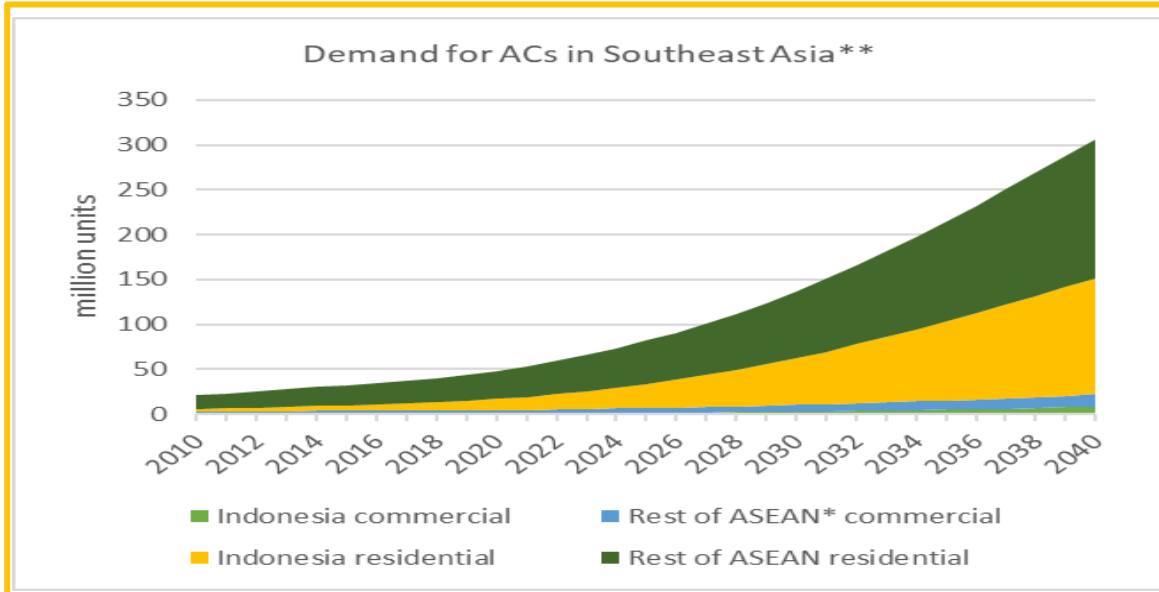
- **USD 630 billion of annual economic loss due to heat stress and 59 million full-time jobs lost in Asia.**
- As the world develop vaccines to prevent future pandemics, **access to cold chains** remains essential for safely storing and transporting vaccines.

Global air conditioner stock and estimate future demand



- **By 2050, around 2/3 of the world's households could have an air conditioner. China, India and Indonesia will together account for half of the total number.**
- **Without addressing energy efficiency, energy demand for space cooling will more than triple by 2050 – consuming as much electricity as all of China and India today.**

Southeast Asia a demand hub for cooling: need to ensure sustainable cooling access

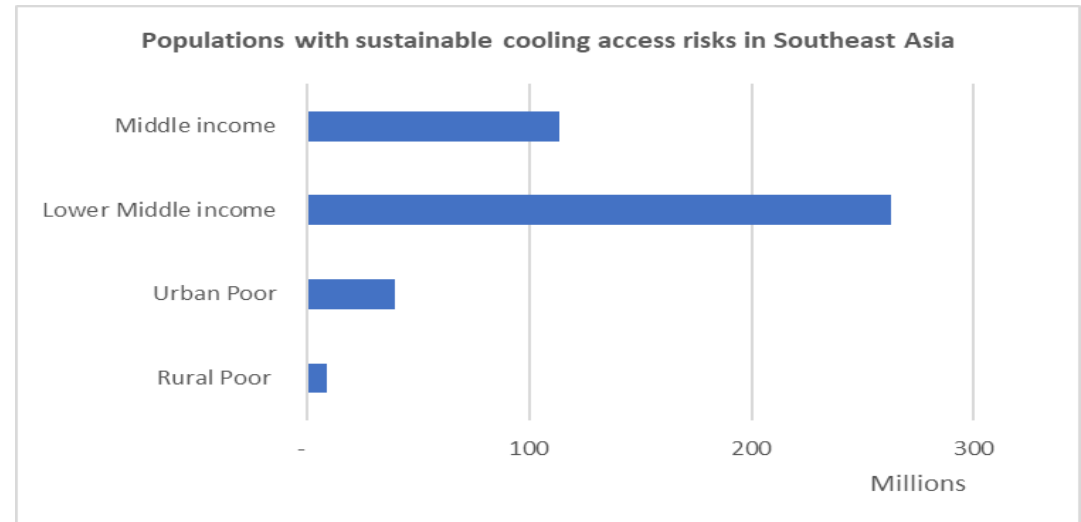


Southeast is expected to have high AC uptake

- Annual demand of 300 million units expected by 2040. Indonesia will be the major market for the AC demand in SE Asia.
- The cooling sector in Southeast Asia has significant importance and will be expected to account for 30% of the peak power demand by 2030.

Rising Middle income and Lower middle-income levels in SE Asia

- In 2018, more than 100 million middle income and 250 million lower middle-income population in SE Asia with lack of access to sustainable cooling.
- Risk of cheap and inefficient cooling solutions to be adopted by these population.



Amidst the pandemic and ongoing recovery efforts, there are opportunities to reset economies and adjust structures of development and competitiveness

The environment we face



Increased illness and mortality (from COVID-19 and other ailments)



Prolonged economic contractions and reduced output



High levels of joblessness



How to recover better with Sustainable energy for all



Rolling out economic stimulus measures and welfare programs



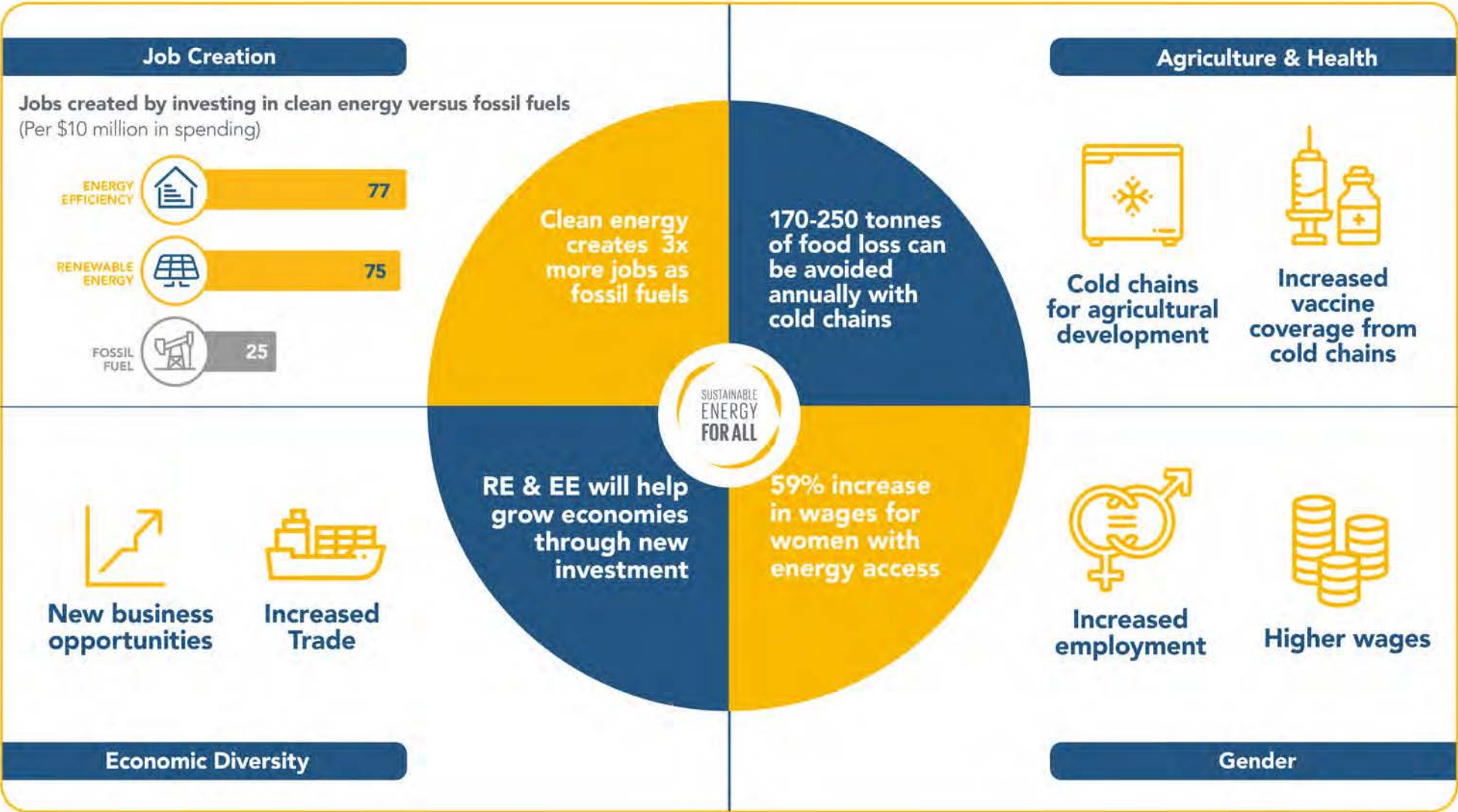
Investing in new technologies, businesses, and systems



Rethinking post-COVID economies and societies

This sustainable energy guide highlights the opportunities, benefits and enablers which will help leaders guide their countries onto a more sustainable long-term development trajectory

Prioritizing sustainable energy will provide economic, employment, commercial, health, and gender benefits to Southeast Asia governments and their citizens



Source: Recover Better Guide SE Asia, SEforALL



Promoting investments to sustainable energy can bring added value to the economy while quickly closing access gaps

Estimated GDP impact

USD 27 billion annual investment to achieve ASEAN RE 2025 target will create an added annual GDP impact of **USD 25 billion**



- It is estimated that a **USD 400 billion energy efficiency investment potential** in Southeast Asia yet to be realized, out of which USD 152 billion represents untapped potential in the buildings sector
- The **energy efficiency interventions** for existing and new buildings could **create about 2.4 million jobs** in Southeast Asia alone.

Southeast Asia can capture further benefits by promoting regionalization of RE and EE equipment value chains

End – Users

Utilities / Power Plants



Distributed Solution Providers



Households and Businesses




GOAL:
30% of value chain localized/regionalized




Up-Stream Value Chain

Component Manufacturing/ Assembly



Solar Home Systems Panels Turbines/Blades Storage Devices Inverters Wires / Poles

Up-stream Value Chain for Energy Efficient Appliances



Fans/Refrigerators LED lighting Entertainment / Connectivity Machinery

To capture this opportunity, governments should address eight actions / reform efforts to unlock a recovery driven by sustainable energy

Promoting Ease of Doing Business

1

- Reducing number and time to obtain permits
- Reducing or eliminating import duties and taxes
- Promote entrepreneurship and cross border trade



Investing in Energy Efficiency

2

- Acknowledging investments in efficiency are the cheapest way to reduce energy demand and GHG emissions.



Enhancing Policies and Regulatory Frameworks

3

- Developing of regulatory frameworks for off-grid and on-grid development
- Empowering of Regulators / Rural Electrification Agencies



Transitioning to Cost Reflective Tariffs

4

- Allowing price for electricity to reflect the actual costs to produce and deliver energy
- Enhancing utility performance and investment attractiveness
- Providing monetary relief for poorer consumers

5

Eliminating Fossil Fuel Subsidies

- Allowing cost of fuels to reflect market prices
- Creating additional fiscal space in budgets
- Enhancing the competitiveness of renewables



Investing in Data

- Identifying of optimal sights for developments
 - Prioritizing of communities for commercial investments in electrification (“productive uses”)
 - Integrating energy planning across technologies to determine least cost connections
- Make available data that promotes investment



6

7

Declaring moratorium on new coal-fired Power

- Recognizing investments in renewables are now cheaper than investments in coal plants in major markets today.
- new investments in coal would make future coal-based power plants stranded assets.



Investing in People to Ensure Access to Jobs

- Ensuring investment in human capital to take advantage of job creation opportunities
- Building a talent pool needed as local industries are established
- Enhancing capacity of Government institutions

8

 **SEforALL.org**

 SEforALLorg

 SustainableEnergyforAll

 SEforALL

Alvin Jose: alvin@seforall.org



Accelerating Industrial Energy Efficiency: UNIDO Approach

APEC Workshop on Energy Efficiency Policy

Nurzat Myrsalieva

18 November 2020

Online





UNIDO *at a glance*

The United Nations Industrial Development Organization (UNIDO) is the specialized agency of the United Nations that promotes industrial development for poverty reduction, inclusive globalization and environmental sustainability.

UNIDO's mission is to promote and accelerate [inclusive and sustainable industrial development](#) (ISID) in developing countries and economies in transition

UNIDO programmatic focus is structured in four strategic priorities:



Creating shared prosperity



Advancing economic competitiveness



Safeguarding the environment

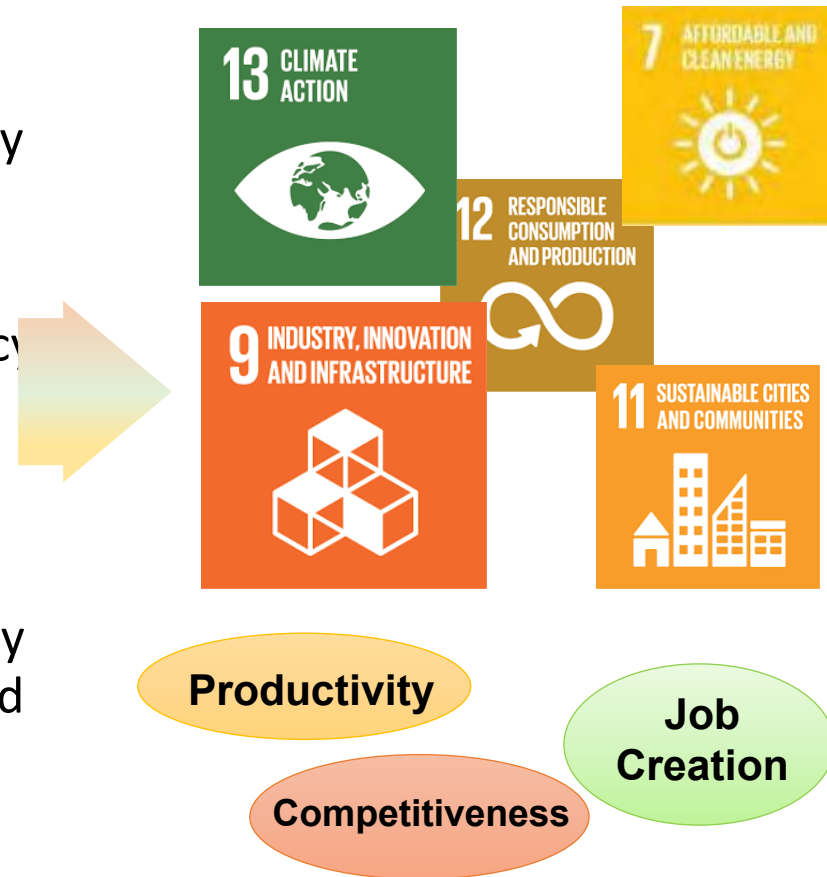


Strengthening knowledge and institutions

Objectives of the Industrial Energy Efficiency Programme

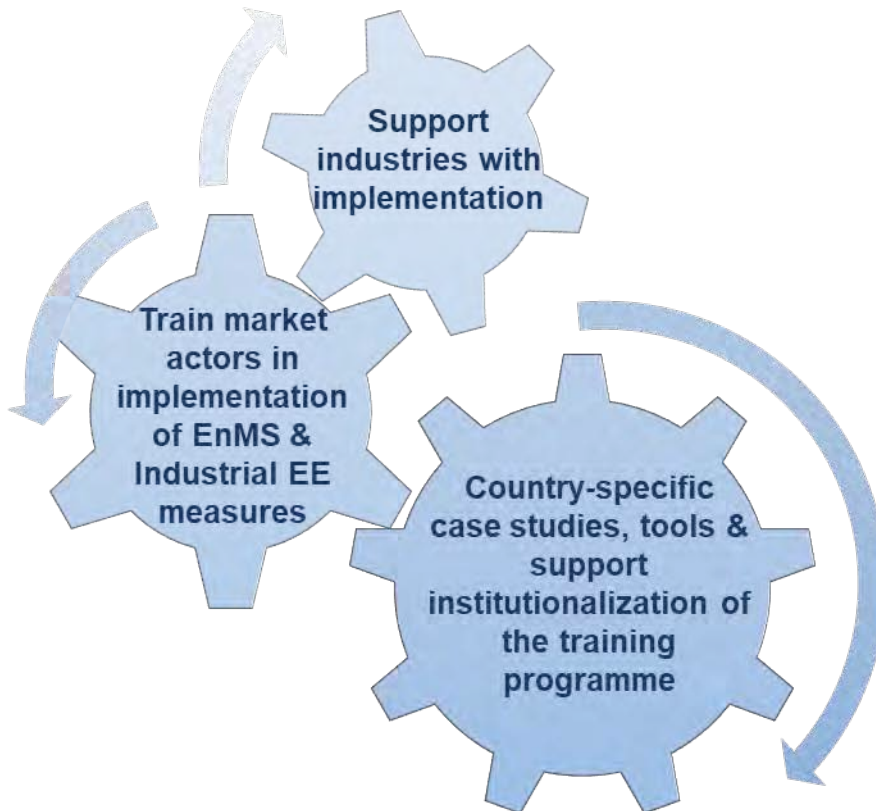
Work together with counterparts, stakeholders and partners to:

- **Strengthen policy** and regulatory frameworks for better & sustainable energy efficiency performance in industry
- **Accelerate adoption** and wide dissemination of industrial energy efficiency best-available practices & technologies
- **Save energy** and reduce GHG emissions of the industrial sector
- **Integrate energy efficiency** in industry daily business practices for sustainable increased productivity & competitiveness



Industrial Energy Efficiency:

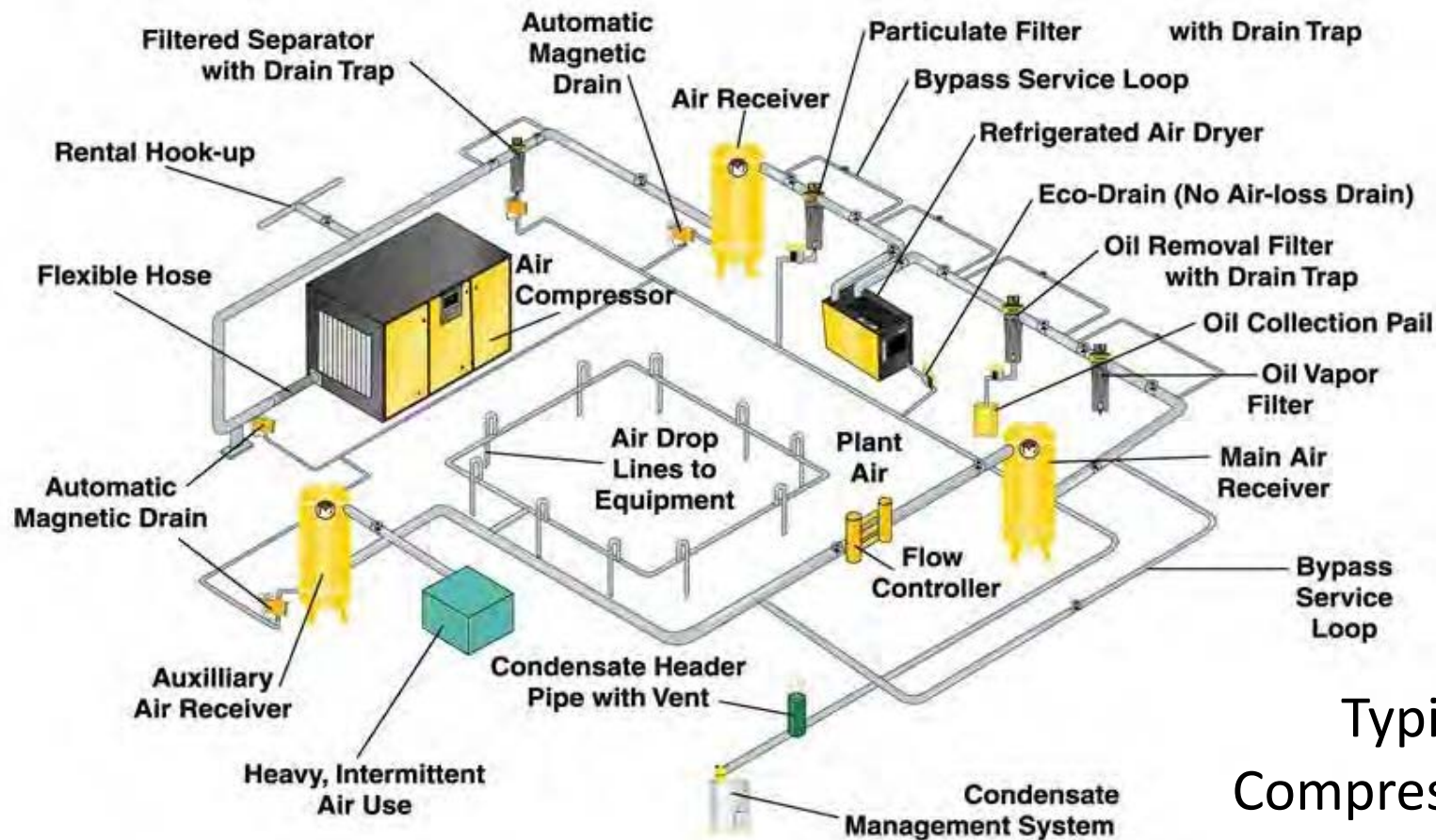
Methodology & Approach:



Content of Capacity Building Programme:

- Implementation of **ISO 50001 Energy Management System (EnMS)**
- Implementation of **Energy System Optimization (ESO)** measures for:
 - Motor-driven systems (pumps, fans, compressors, motors)
 - Industrial heat (steam systems, process heat, waste heat recovery)
 - Industrial cooling & refrigeration systems
- Integration of Renewable Energy systems for industrial processes;
- Preparation of financially sound investment proposals;
- Corporate GHG Accounting, Verification & Reporting

What we mean by Energy System



Typical
Compressed-air
System

Source: W. Perry for UNIDO

UNIDO Global EnMS-ISO 50001 Programme – Jun 2020

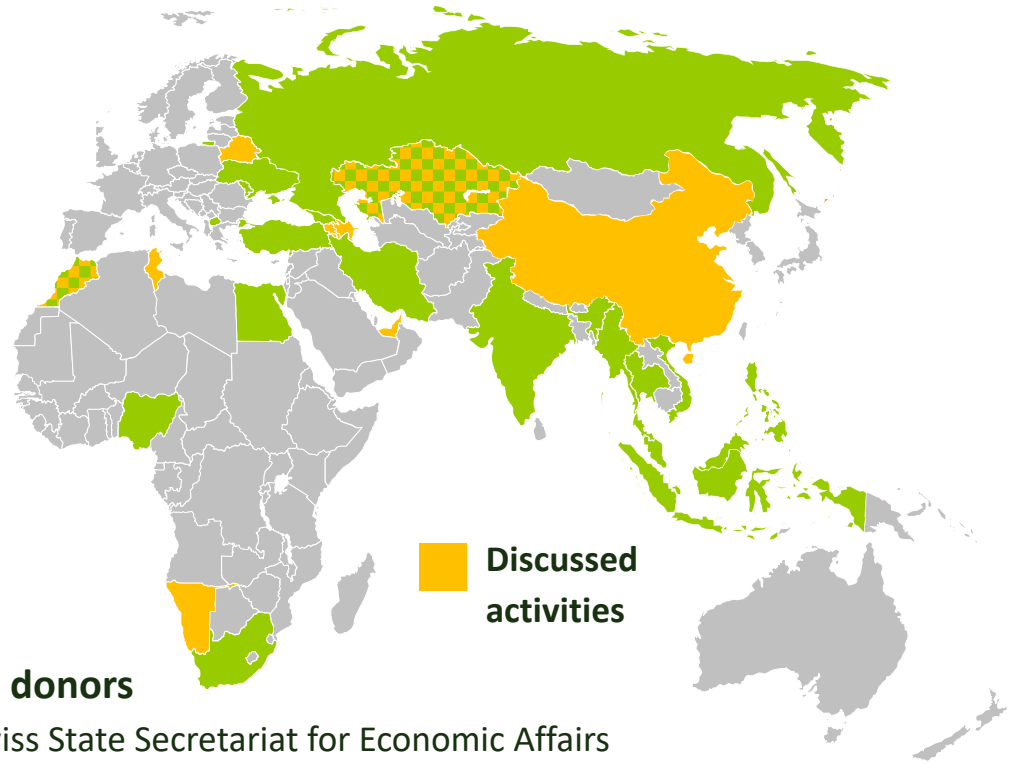


GLOBAL ENVIRONMENT FACILITY
INVESTING IN OUR PLANET

Operational in 21 countries
Planned activities in 10+ countries

Projects

- | | |
|--------------|-----------------|
| South Africa | Iran |
| Moldova | Ukraine |
| Russia | Colombia |
| Turkey | Myanmar |
| Ecuador | India |
| Malaysia | Georgia |
| Thailand | North Macedonia |
| Viet Nam | Morocco |
| Philippines | Cuba |
| Indonesia | Nigeria |
| Egypt | |



Discussed activities

Other donors

- ✓ Swiss State Secretariat for Economic Affairs
- ✓ UK Department for International Development
- ✓ Government of South Africa
- ✓ Government of Italy
- ✓ Government of Austria

Accelerating Industrial Energy Efficiency



Where we work

The Accelerator currently operates in 12 countries responsible for over 35 per cent of the world's energy consumption. Each of our partner countries are home to major industries with huge energy efficiency potential.

Don't see your country on the map?

Contact us to find out how we can join forces and make industrial energy efficiency a reality in your region:
www.industrialenergyaccelerator.org

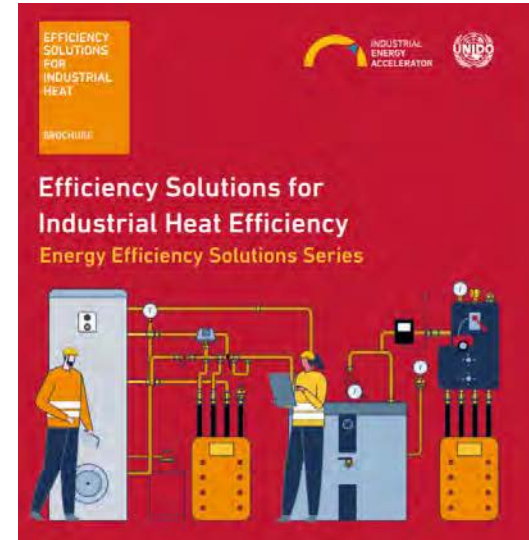
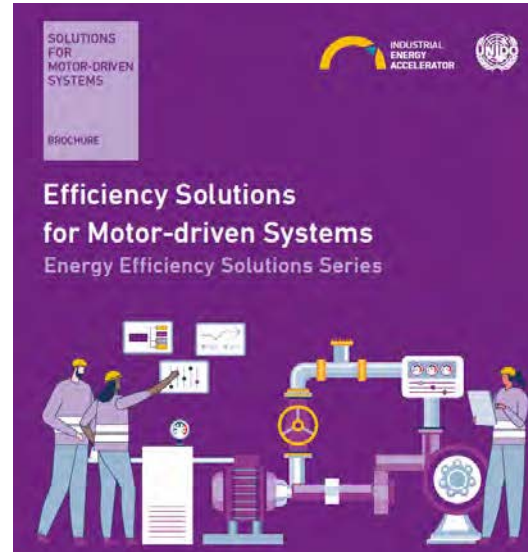
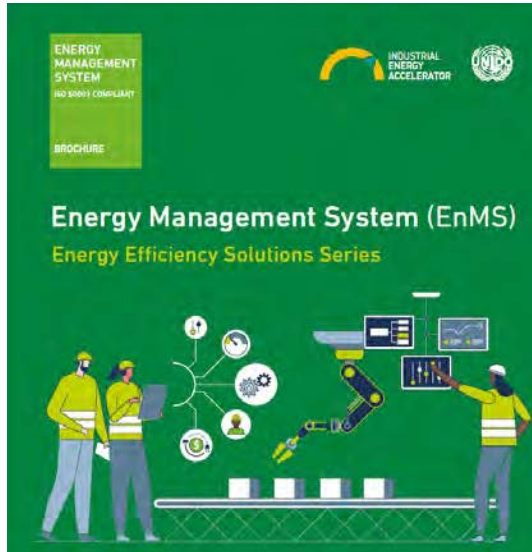


Supported by



The Industrial Energy Accelerator is a UNIDO-led global platform to encourage uptake of industrial energy efficiency

Energy Efficiency Solutions for Industries:



Download the knowledge kits from:
www.industrialenergyaccelerator.org

Example 1 : Iron and Steel – South Africa

Arcelormittal Saldanha Works



- ✓ Electricity demand : 160 MW
- ✓ Manpower: 548 permanent employees
- ✓ Sales output: 1,2 million ton HRC/annum

Adjustments/optimization of production operations, energy systems optimization, fuels switching, etc.....
driven by EnMS!

2012 Energy Savings (Norm.) > 100 GWh



Energy Efficiency Achievements 2011

Energy Management System Implemented

No. of Projects/Measures	11
Total Capital Investment (USD)	0
2011 Gross Financial Savings (USD)	9,076,000
Overall Payback Period (in years)	0
2011 Energy Savings Norm. (GWh)	79.95
2011 GHG Reductions (tons CO ₂)	77,000

Accelerating Industrial Energy Efficiency: Our Projects



EGYPT

MAJOR INDUSTRIES
Non-metallic minerals sub-sector (including cement, pig-iron, metal)

PROJECT

STRATEGY

Accelerating the uptake of energy efficient motors in industry.

KEY PROJECT TARGETS

- 1 Conducive Policy tools to promote the use of energy efficient Motor Systems
- 2 300 end users, suppliers and experts trained on Energy Efficiency in Motor Driven Systems
- 3 30 industrial facilities supported
- 4 Support 5 energy service providers to provide energy efficiency

ENERGY SAVINGS



598,000 TONS CO₂ equivalent of direct GHG emissions and 1.9 million tons of indirect emissions, which is roughly equivalent to the per capita emissions of more than 750 million Egyptians.

ENVIRONMENTAL IMPACT



115,000 MWh by the end of the project, equivalent to electricity consumption of approximately 70,000 Egyptian households.



INDIA

MAJOR INDUSTRIES
Iron & steel, textiles & garment production, food value-chain, agriculture, dairy

PROJECT

OBJECTIVE

Accelerate the growth and deployment of low carbon technology for industrial energy efficiency in India.

FEATURE PROJECT TARGET

Facilitate 20 innovation challenges that contribute to the development of at least 120 low-carbon intensive innovations.

ENVIRONMENTAL IMPACT



GHG emission REDUCTION of 2,300,000 TONS equivalent to the carbon footprint of half-a-million people.

ENERGY SAVINGS



By far the largest share of energy savings can be made in the agricultural, dairy and cold-chain food distribution sectors.

For example, in 2016, India's outdated agricultural pumps were estimated to consume 170 billion units of energy. A replacement of just 200,000 agriculture pumps with 200,000 BEE star-rated pump sets is estimated to lead to 30 per cent of energy savings and a cost saving of potentially \$3 billion (govt. figures).



MALAYSIA

MAJOR INDUSTRIES
Iron & steel, cement, wood, food, glass, pulp & paper, ceramics, rubber, chemical, plastics and textiles.

PROJECT

OBJECTIVE

Improving regulations, technical capacity and financial incentives for an accelerated growth of solar thermal energy applications and industrial energy efficiency improvements.

ENERGY SAVINGS



100 MILLION kWh from SOLAR THERMAL and **11.25 BILLION kWh** from THERMAL ENERGY EFFICIENCY, which is equivalent to powering 2.4 million Malaysian households for a year.

ENVIRONMENTAL IMPACT



REPUBLIC OF SOUTH AFRICA

PROJECT

STRATEGY

Accelerating the adoption and mainstreaming of energy management systems (EnMS), energy systems optimization (ESO), and the Energy Management Standard ISO 50001 series in South African industrial and commercial sectors, supporting strengthened policy and regulatory frameworks, and expanding the capacity of South African industry to implement EnMS and ESO through skills development and the development of a funding mechanism for energy efficiency projects.

FEATURE PROJECT TARGET

150 South African enterprises reduce their exposure to energy shortages through improved energy management and systems optimization.¹

ENERGY SAVINGS



5.82 BILLION kWh roughly equivalent to the electricity needed for nearly 2 billion hours of air conditioning.*

ENERGY COSTS AVOIDED

\$245 MILLION²

ENVIRONMENTAL IMPACT



Avoidance of **5.8 MILLION TONS** of CO₂ GHG emission, equivalent to the per capita emissions of more than 600,000 South Africans.^{3†}



UKRAINE

MAJOR INDUSTRIES
Power generation, chemical and petrochemical and gas, machine-building and metal-working, forestry, wood-working and wood pulp and paper, construction materials, agriculture.

PROJECT

OBJECTIVE

Supporting the national introduction and roll-out of the ISO 50001 Energy Management System (EnMS) Standard.

FEATURE PROJECT TARGETS

- 1 At least 18 companies implement Energy Management Systems and are certified to the ISO50001 standard.
- 2 60 energy management system (EnMS) and energy system optimization (ESO) experts are trained and qualified to support EnMS-ISO 50001 roll-out.
- 3 One financial instrument, which promotes and supports wider implementation of EnMS-ISO 50001 and industrial energy efficiency, is established.

ENERGY SAVINGS



3.3 BILLION kWh energy savings over 10 years, roughly equivalent to the annual energy consumption of over one million Ukrainians.

ENVIRONMENTAL IMPACT



Avoidance of **580,000 TONS** of CO₂ emissions, roughly equivalent to the per capita GHG emissions of **116,000** Ukrainians.

INVESTMENT GENERATION

\$30,000,000

¹ From the period of 2014 - 2020.
² 2016/17 average rate as of the end of April 2016.
³ The Carbon Brief Profile for South Africa.
[†] Energy savings, costs avoided and environmental impact targets are for the period between April 2011 and 2020.

Achievements after 10 years of EnMS implementation



650+
EnMS EXPERTS
QUALIFIED



OVER
3500
COMPANIES TRAINED
in EnMS



MORE THAN
500
COMPANIES
directly supported
throughout EnMS
IMPLEMENTATION



MORE THAN
1,000
DECISION MAKERS, POLICY MAKERS,
FINANCIAL AUTHORITIES, SERVICE
PROVIDERS AND TOP MANAGEMENT directly
engaged in training and related initiatives



4-15%
OF ENERGY SAVED
per company in the first year of
EnMS implementation with little
or no capital investment



CUMULATIVE PRIMARY
FINAL ENERGY
savings exceed
25,000 GWh



MORE THAN
\$400 MILLION USD
saved in CUMULATIVE
ENERGY COST
SAVINGS



MORE THAN
10 MILLION TONS of CO₂
EMISSIONS avoided, roughly
equivalent to the carbon
sequestered by 150 million
10-year-old trees*

*United States Environmental Protection Agency,
Greenhouse Gas Equivalencies Calculator

DRIVING THE SHIFT

– TOWARDS A SUSTAINABLE TRANSPORT SYSTEM



Scania's aim is to drive the shift towards a sustainable transport system, creating a world of mobility that is better for business, society and the environment.



SCANIA'S SCIENCE BASED TARGET

50%

CO₂ reduction from our operations by 2025 (2015)

SCOPE 1&2

20%

CO₂ reduction from our products by 2025 (2015)

SCOPE 3

OUR APPROACH TO SUSTAINABLE TRANSPORT



Energy efficiency



Alternative fuels
and electrification



Smart and safe
transport



ENERGY EFFICIENCY

**New
truck range**

Average 5%
fuel savings

**Optimised
specification**

Based on
operational analysis

**Optimised
driving**

Scania Driver
services

**Optimised
maintenance**

Maintenance+



Energy efficiency



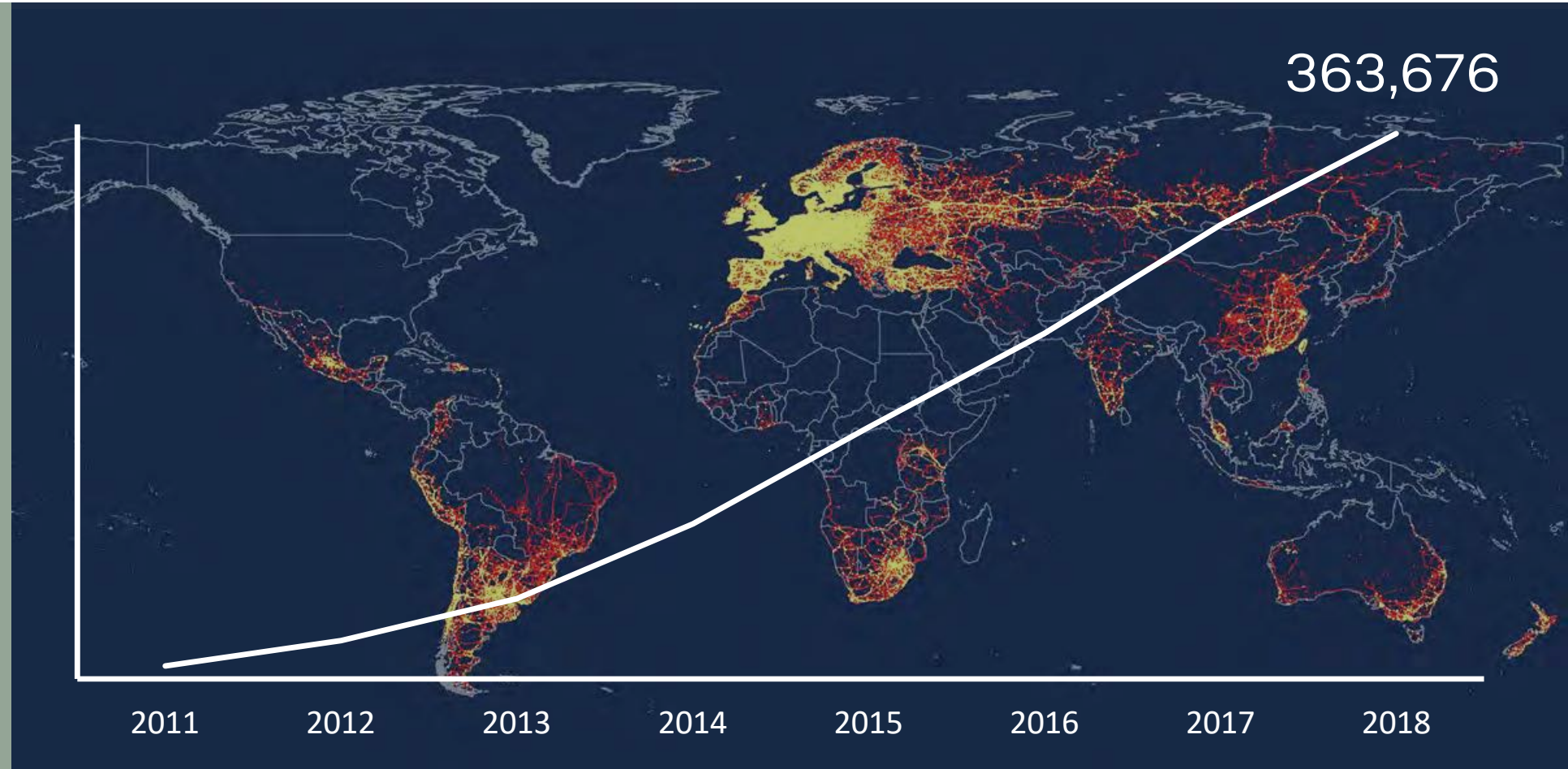


CONNECTED VEHICLES

>70% OF 5 YEAR ROLLING FLEET



Smart and
safe transport





AUTONOMOUS VEHICLES



Smart and
safe transport





BUS RAPID TRANSIT



Smart and
safe transport





BATTERY ELECTRIC VEHICLES



Alternative fuels
and electrification





ELECTRIC ROADS



Alternative fuels
and electrification



SCANIA



Scania helps you solve your urban mobility



SCANIA



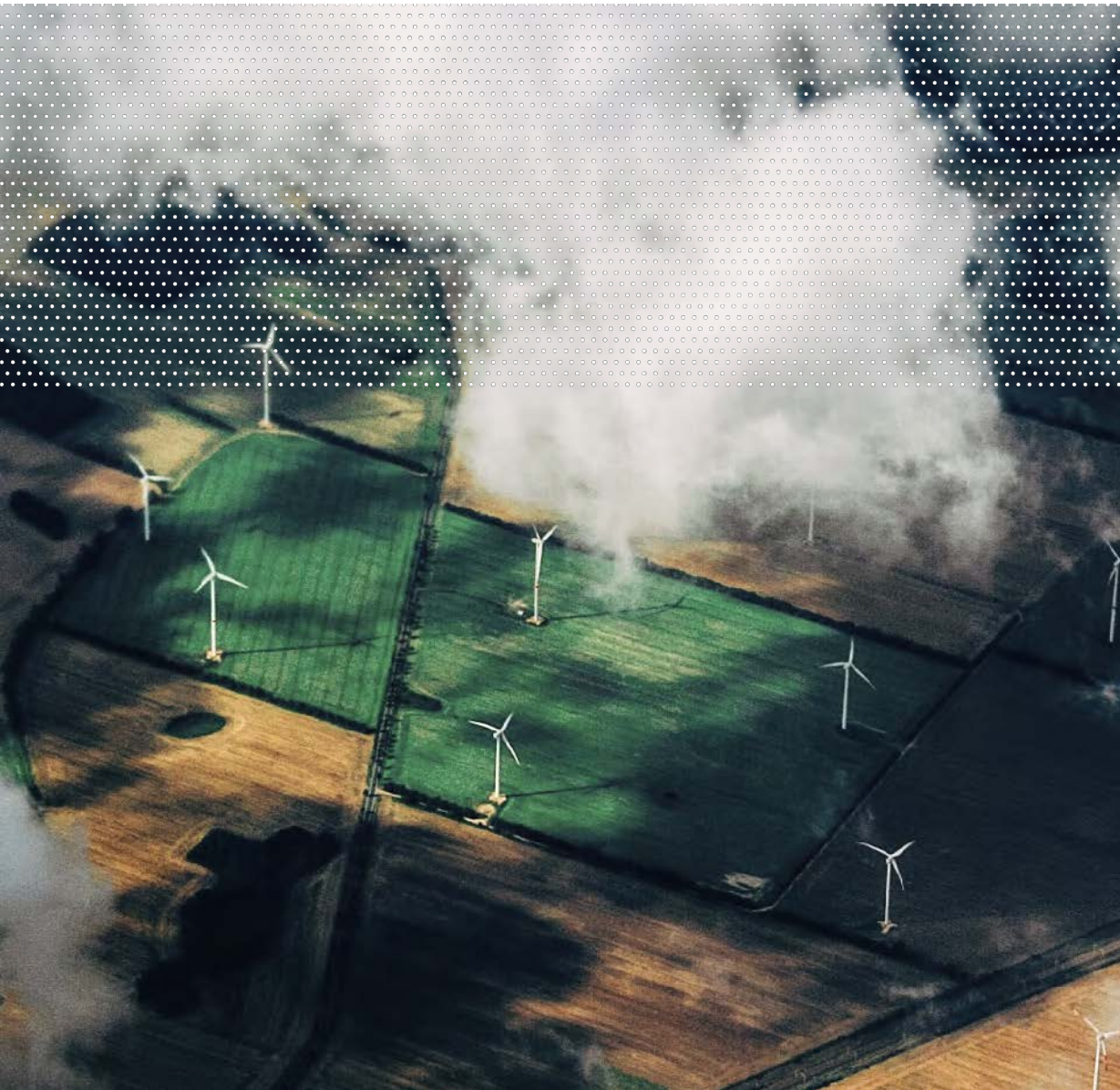


DRIVING THE SHIFT

TO A SUSTAINABLE TRANSPORT SYSTEM



SCANIA



Economic recovery through energy efficiency

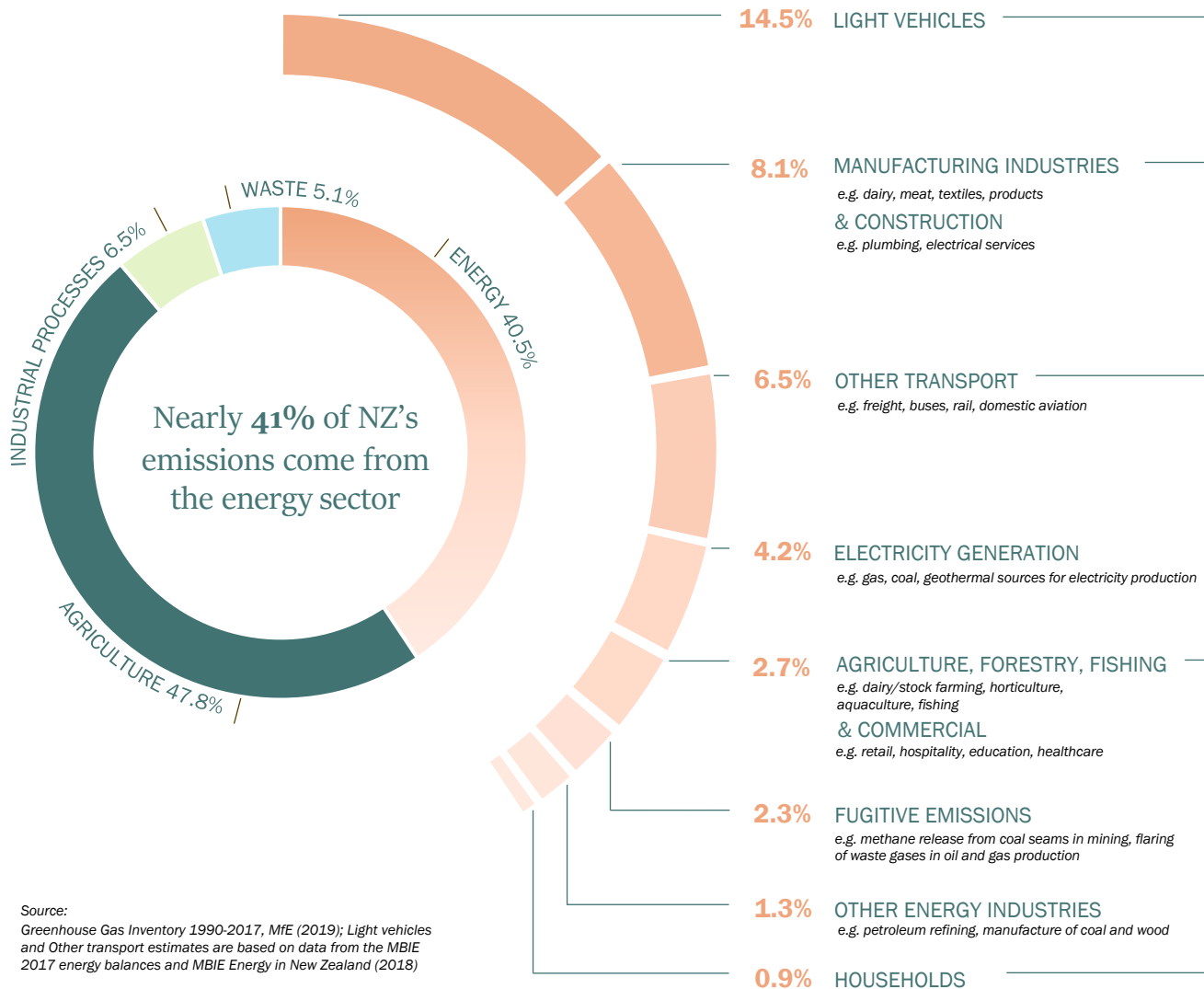
A New Zealand example

Presented by Nina Campbell, Senior Advisor
Energy Efficiency & Conservation Authority of NZ
18 November 2020

TE TARI TIAKI PŪNGAO
ENERGY EFFICIENCY & CONSERVATION AUTHORITY



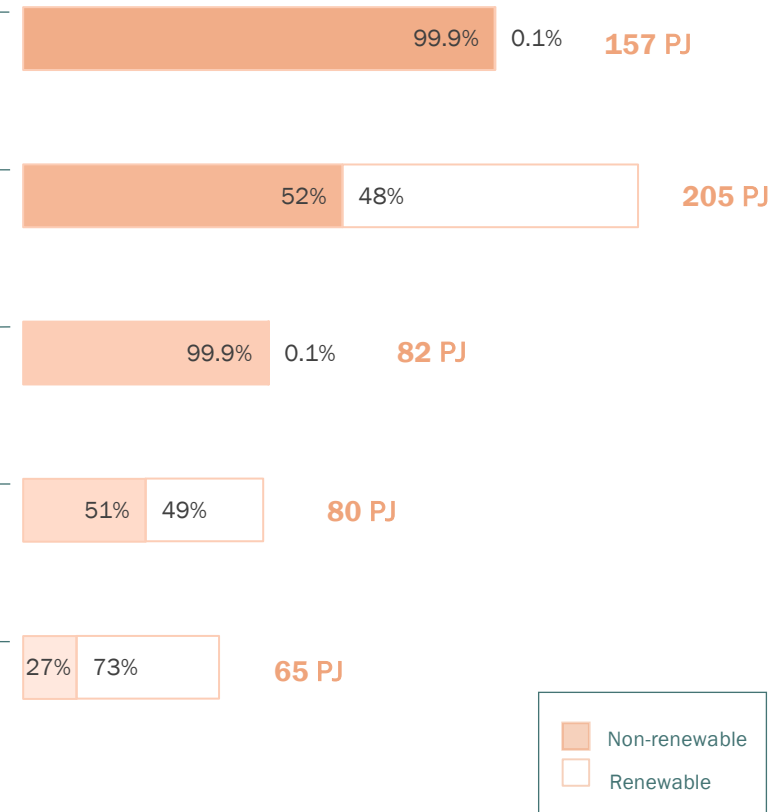
New Zealand's greenhouse gas emissions



Source: Greenhouse Gas Inventory 1990-2017, MfE (2019); Light vehicles and Other transport estimates are based on data from the MBIE 2017 energy balances and MBIE Energy in New Zealand (2018)

Energy use

Over two thirds of the energy used in New Zealand comes from **non-renewable** energy sources



Source: MBIE's 2018 Energy Balance Tables, electricity statistics and Energy in New Zealand (2019)

Stimulus funding in the energy sector

- Decarbonising industrial process heat
- Low emission vehicles contestable fund
- State sector decarbonisation
- Five 'shovel ready' infrastructure projects:
 - Invercargill Renewable District Heating System (100% funded)
 - Electric and Hydrogen-ready Hybrid Ferries (45% funded)
 - Minimum Viable Hydrogen Refuelling network (30% funded)
 - Thermal Sludge-Drying Facility Replacement (76% funded)
 - Energy Hardship Alleviation – Housing energy efficiency (38% funded)
- *Warmer Kiwi Homes* expansion (90% co-funding)
- Distributed energy for public and Māori housing
- Energy hardship work programme

Stimulus investment principles

Applying a wellbeing approach to investment and decision-making.

- **Maximising impact:** demonstrate a significant contribution to:
i) decarbonisation; ii) supporting employment and economic activity; and iii) improving wellbeing, especially among low-income groups.
- **Encouraging innovation:** support early adopters of technologies that demonstrate wide replication and emissions abatement potential but may carry increased technological risk or uncertainty.
- **Leveraging co-funding:** maximise number of projects by leveraging co-funding opportunities and existing funding mechanisms
- **Implementation-readiness:** projects must be implementation-ready
- **Additionality:** projects that are unlikely to be implemented in the short term without government support.

Example:

Evaluating energy hardship alleviation

- Outcome objectives enlarged
 - Reducing energy costs for low-income households
 - Health and wellbeing benefits
 - economic stimulus and job creation; and
 - supporting continuous improvement of energy hardship policies
- Investment in thorough evaluation of *Warmer Kiwi Homes* flagship programme = basis for other evaluations
- Linked up evaluation for related programmes
 - Cross-agency evaluation steering groups (and beyond government)
 - Alignment of metrics and methods
 - Sharing learnings across agencies

Thank you

Nina.Campbell@eeeca.govt.nz

www.eeeca.govt.nz

(energy efficiency advice)

www.genless.govt.nz


(behaviour change)


EECA's strategy


Our purpose


Mobilise New Zealanders to be world leaders in clean and clever energy use


Our strategic principles

 **Focus on impact**
Pursue high-impact change with agility and at pace.


 **Understand the customer**
Focus on those it is important to influence and influence them based on what they care about.


 **Define the problem**
Identify what's blocking progress and tackle it head on.


 **Join the dots**
Work with and connect people and organisations who can be part of achieving our purpose.


 **Display leadership**
Be proactive, have a fact-based point of view, own it.


Our strategic focus areas

 **Productive and low-emissions business**
Mobilise decision makers and technical experts to accelerate action.

 **Efficient and low-emissions transport**
Switch the fleet to low-emissions technology while ensuring that any remaining fossil-fuelled vehicles are as efficient as possible.

 **Energy efficient homes**
Optimise New Zealanders' use of renewable energy through energy efficient homes, technologies and behaviours.

 **Government leadership**
Equip the public sector to innovate and lead the transition to clean and clever energy use.

 **Engage hearts and minds**
Foster a society in which sustainable energy is expected and demanded.

Our desired outcome

A sustainable energy system that supports the prosperity and wellbeing of current and future generations

Our outcomes framework

Our desired outcome:

A sustainable energy system that supports the prosperity and wellbeing of current and future generations

Outcomes by focus area:



Productive and low-emissions business

- ✓ EECA's client businesses demonstrate best practices, continuously improve their energy and emissions productivity and motivate other businesses to take action
- ✓ New Zealand businesses are continuously improving their energy productivity and using sustainable energy to contribute to New Zealand's emissions reduction target



Efficient and low-emissions transport

- ✓ More New Zealanders choose a low-emissions vehicle over a fossil-fuelled vehicle and have a good experience using it
- ✓ People who do not buy a low-emission vehicle choose a more efficient fossil-fuelled vehicle



Energy efficient homes

- ✓ Households consume electricity more efficiently to reduce peak loading on infrastructure
- ✓ More New Zealanders live in energy efficient homes and make informed choices on energy efficient technologies and behaviours



Government leadership

- ✓ The state sector is an exemplar in improving its energy productivity and reducing its energy related emissions
- ✓ State services implement energy policy and programme to accelerate the transition to clean and clever energy use in New Zealand



Engage hearts and minds

- ✓ New Zealanders feel that the way they use energy positively contributes to achieving New Zealand's climate change commitments
- ✓ New Zealanders expect and demand energy-related products and services based on their energy efficiency and sustainability

We are working to:

Mobilise decision makers and technical experts to accelerate action.

Switch the fleet to low-emissions technology while ensuring that any remaining fossil-fuelled vehicles are as efficient as possible.

Optimise New Zealanders' use of renewable energy through energy efficient homes, technologies and behaviours.

Equip the public sector to innovate and lead the transition to clean and clever energy use.

Foster a society in which sustainable energy is expected and demanded.

Our levers

Co-investing



We co-invest in energy-efficient technologies and renewable sources of energy

Motivating people




We motivate people to make clean and clever energy choices

Regulating



We regulate proven technologies and processes



positive systems change

NZ Treasury's Wellbeing Approach

The Four Capitals

Intergenerational wellbeing relies on the growth, distribution, and sustainability of the Four Capitals. The Capitals are interdependent and work together to support wellbeing. The Crown-Māori relationship is integral to all four capitals. The LSF is being continually developed and the next iteration of the framework will consider the role of culture, including Māori culture, as part of the capitals approach in more detail.



Natural Capital



This refers to all aspects of the natural environment needed to support life and human activity. It includes land, soil, water, plants and animals, as well as minerals and energy resources.



Social Capital



This describes the norms and values that underpin society. It includes things like trust, the rule of law, the Crown-Māori relationship, cultural identity, and the connections between people and communities.



Human Capital



This encompasses people's skills, knowledge and physical and mental health. These are the things which enable people to participate fully in work, study, recreation and in society more broadly.



Financial / Physical Capital

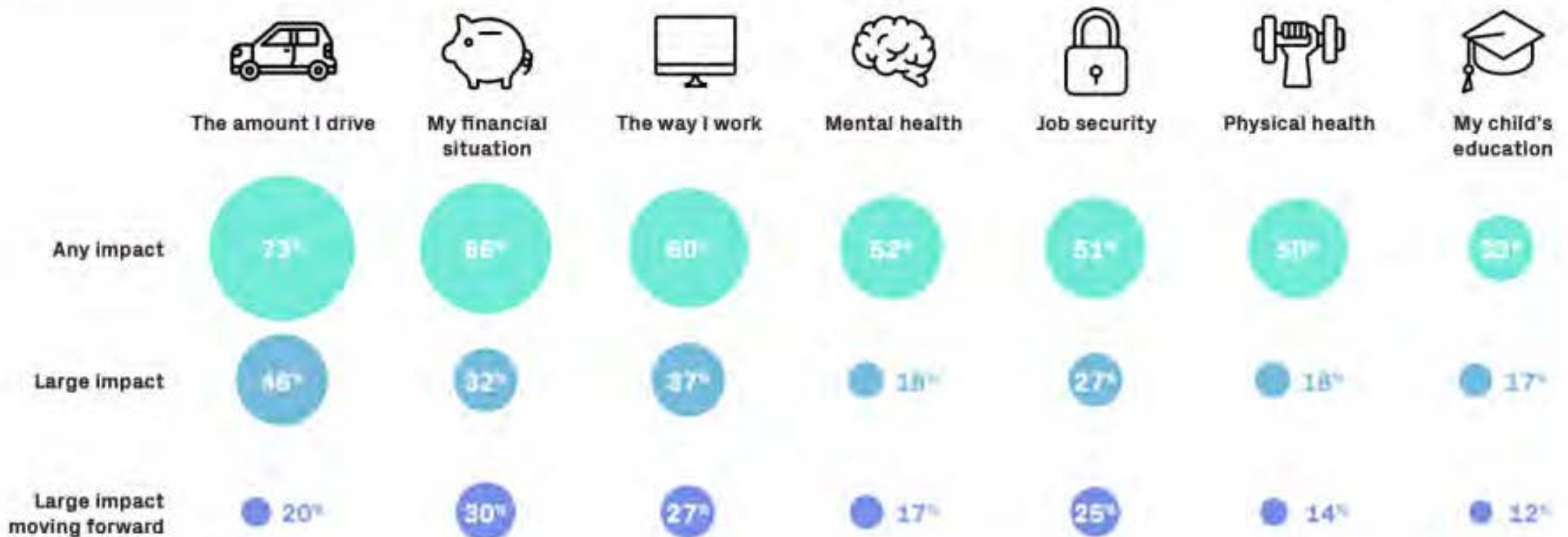


This includes things like houses, roads, buildings, hospitals, factories, equipment and vehicles. These are the things which make up the country's physical and financial assets which have a direct role in supporting incomes and material living conditions.

Many Kiwis have seen an impact in some area of their lives

There is an ongoing anticipated impact on working situations, while some other impacts were more specific to lockdown.

Impact of C19 on New Zealanders' Lifestyle



Source: EECA Consumer Monitor. C19_CURRENT - And in which of these ways is the COVID-19 situation impacting you currently? C19_FUTURE - How do you expect the COVID-19 situation to impact on you over the next 6 months Base: n=624 New Zealanders.