KIGALI

COOLING EFFICIENCY PROGRAM

Cooling efficiency finance case studies

KIGALI
COOLING EFFICIENCY PROGRAM

CARBON TRUST

CONTENTS

INTRODUCTION

The Kigali Amendment to the Montreal Protocol will deliver substantial greenhouse gas reductions by moving cooling systems to lower global warming potential (GWP) refrigerants. The impact of this transition can be magnified by simultaneously improving their energy efficiency. Left unchecked, cooling could account for nearly 20% of CO2 emissions by 2050, however efficient, clean cooling has the potential to remove the equivalent of 100 Gt CO2e of greenhouse gas emissions cumulatively between now and 2050.

K-CEP aims to make an important contribution towards realizing the huge benefits of cooling efficiency and envisages a world in which efficient, clean cooling is accessible to all.

The IEA estimates that $1.6 trillion will need to be spent on improving heating and cooling energy efficiency in buildings from 2014-2035 to implement new policy commitments announced at the UNFCCC's COP21. Many industrial, commercial, and residential cooling consumers will be capital constrained when faced with meeting these investments. A substantial proportion (the IEA estimates 40%) of the efficient, clean cooling investment requirement will need to come from external sources.

For consumers needing external funding, climate finance – whether from governments, development banks, philanthropic foundations or in partnership with the private sector - can play a vital role in unlocking and providing the capital for efficient, clean cooling. Which is why K-CEP has a dedicated 'window' focused on supporting the deployment of this much needed finance.

There has been a common struggle across many of the more general energy efficiency programs worldwide to create sustainable markets beyond their initial lifespan that are effective in leveraging private finance in their target markets. Although the emphasis in these programs is often on the capital they provide and the financial instruments they use, challenges to success are prevalent across the supply chain – and include awareness and technical issues as well as access to finance itself.

Analysis of the barriers to scaling up finance for more efficient, clean cooling identified six key aspects to consider in the design of any successful efficient, clean cooling finance scheme. These are summarized in Figure 1 below:

1 International Energy Agency (IEA), World Energy Investment Outlook – Special Report, 2014
2 Ibid

The following case studies included in this briefing paper, examine seven examples of finance schemes either exclusively targeting greater cooling efficiency or including cooling efficiency as part of a broader energy efficiency remit. We set out the key features of each scheme in terms of the design criteria set out in Figure 1. In conclusion we provide some observations on the pros and cons of each category of scheme.

The case studies show that significant finance has been deployed for energy efficiency. These investments have delivered large emissions and energy use reductions, and in some cases levels of financing compare with supply side investments. However financing cooling efficiency is not without challenges including:

- Balancing the objectives of closely matching solutions with barriers and keeping schemes simple and easy to use in the design of financial mechanisms;
- The design of eligibility criteria to ensure take-up;
- The possibility of a rebound effect resulting in increased energy use, which at its extreme could offset savings made through efficiency;
- The importance of awareness raising in generating take-up;
- Driving the right level of competition and scale in bulk procurement-based schemes;
- Ensuring the technical supply chain (e.g. equipment suppliers) is sufficient to support programs;
- Understanding and guaranteeing the leverage of additional finance using public funding;
- Using ESCO models effectively to guarantee energy and cost savings;

The importance of policy frameworks is often cited as key for effective financing of energy efficiency, and for climate mitigation efforts more generally. Whilst there is no doubt that policy can realize significant progress, historical and current evidence of government leadership globally tell us that reliance on policy is not enough. Other influential actors need to play their part in reducing carbon pollution, including the finance community as it directs trillions of dollars in the global economy.

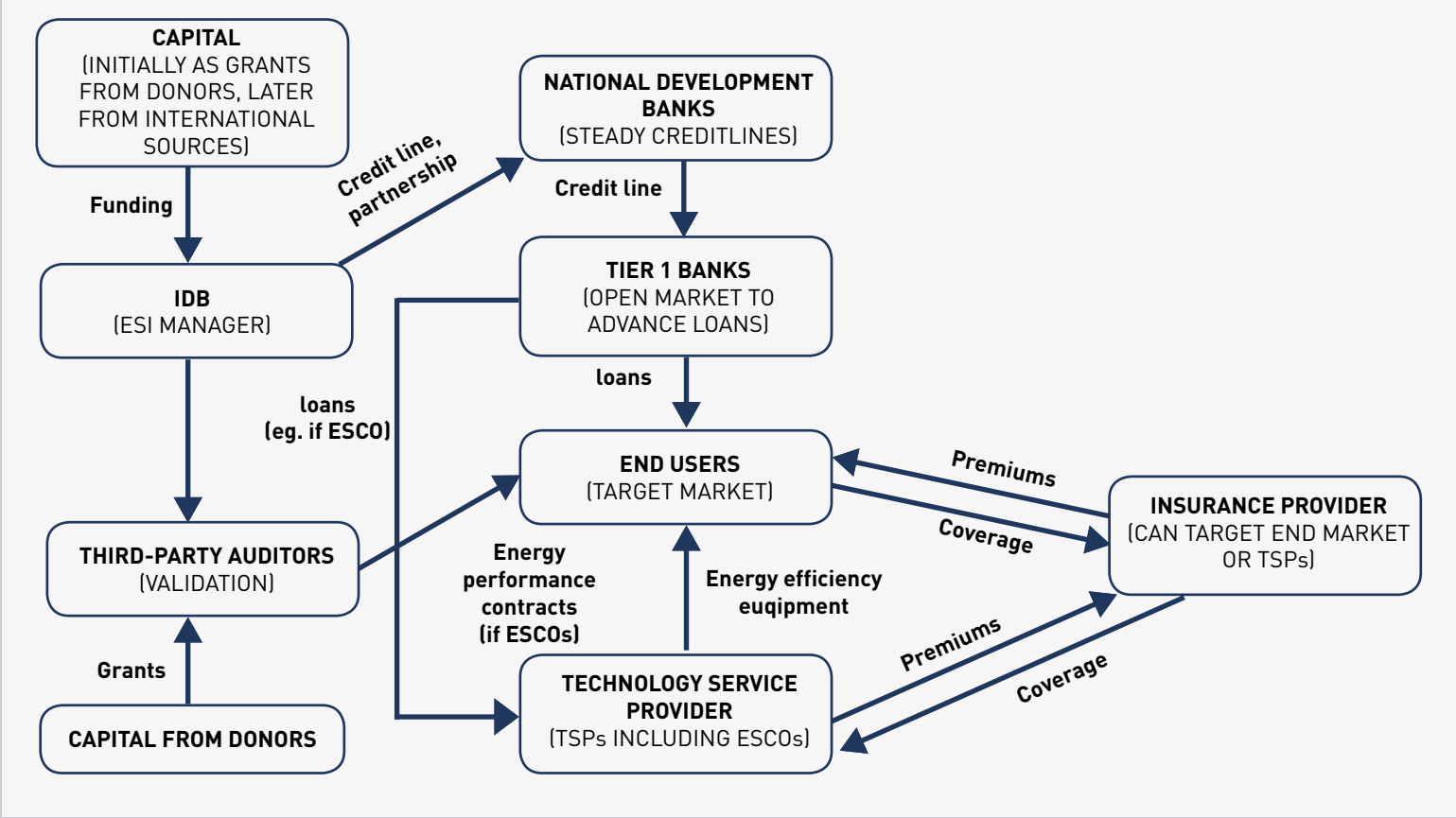
We hope these case studies inform and inspire additional financing of efficient, clean cooling, commensurate with the need to cut carbon pollution from cooling and realize the health, economic productivity and energy access benefits that are both possible and vitally needed.

Energy Savings Insurance (ESI) (SEAD, 2015)

COUNTRY / REGION	**LATIN AMERICA (UNDERWAY IN MEXICO & COLOMBIA; IN DEVELOPMENT IN BRAZIL, NICARAGUA & PERU) PREPARATORY WORK IN ARGENTINA AND PARAGUAY.**		
GOALS	Catalyse energy efficiency in Latin America	**FINANCING**	• Standardized Energy Performance Contracts (EPCs) between SMEs & Technology Service Providers (TSPs) reduce cost of transactions, address need for legal expertise & respond to risk of low performance. • TSPs encouraged to offer ESI from certified insurance providers to SME. • In case of underperformance, insurance compensates SME.
OBJECTIVE	Create Energy Savings Insurance (ESI) Scheme		
TIMEFRAME	2015 TO 2020		
TOTAL SIZE	Not disclosed	**RESULTS**	If implemented in all relevant developing countries, the ESI aims to attract $10-$100bn in energy efficiency project investments between now and 2030 and provide annual emissions reduction of 20-200MtCO2. Mexico target: $25m in >190 projects with 2-5 year payback. Colombia target: $25m in >125 projects focusing on hotels, clinics & hospitals (Clean Energy Forum, 2017).
INVESTMENT: SIZE / RANGE	Average cost of EE projects in the scheme is $250,000 with a range of $30,000-$2m (Clean Energy Forum, 2017).		
ACTIVITIES	• Create energy savings insurance market • Partnerships with national development banks to build steady credit lines • Develop policy framework • Develop support mechanism • Develop standardized structures	**OBSERVATIONS**	The ESI program has been recognised by the Global Innovation Lab for Climate Finance as a promising instrument to mobilise private sector investments in EE. It can overcome barriers to investment by enhancing confidence of investors that they will receive ROI. ESI can also raise awareness in local financial institutions of the risk and returns of these projects and increase their willingness to invest. However with several different parties to the transaction, the complexity of the supply chain is higher than standard transactions, potentially discouraging uptake.
ELIGIBILITY	SMEs & Technology Service Providers		
PROGRAM MANAGER	Inter-American Development Bank (IDB)	**PROGRAM OPERATOR**	IDB
FINANCIAL PROVIDER	IDB is the main sponsor, supported by other donors, e.g. Clean Technology Fund, Green Carbon Fund		

ENERGY SAVINGS INSURANCE (ESI)

FINANCIAL MECHANISM



Energy Savings Insurance (ESI) (SEAD, 2015)

1 Target market

SMEs

2 Drivers

Policy targets to reduce GHGs and national energy efficiency targets.

3 Supply chain

Addtional actors can absorb the risks but also increase the number of transactions

4 Barriers

Lack of trust, lack of knowledge of technologies

5 Solutions

Comprehensive insurance package including standardised insurance scheme contracts; risk assurance; third party audits within a policy framework

6 Sustainability

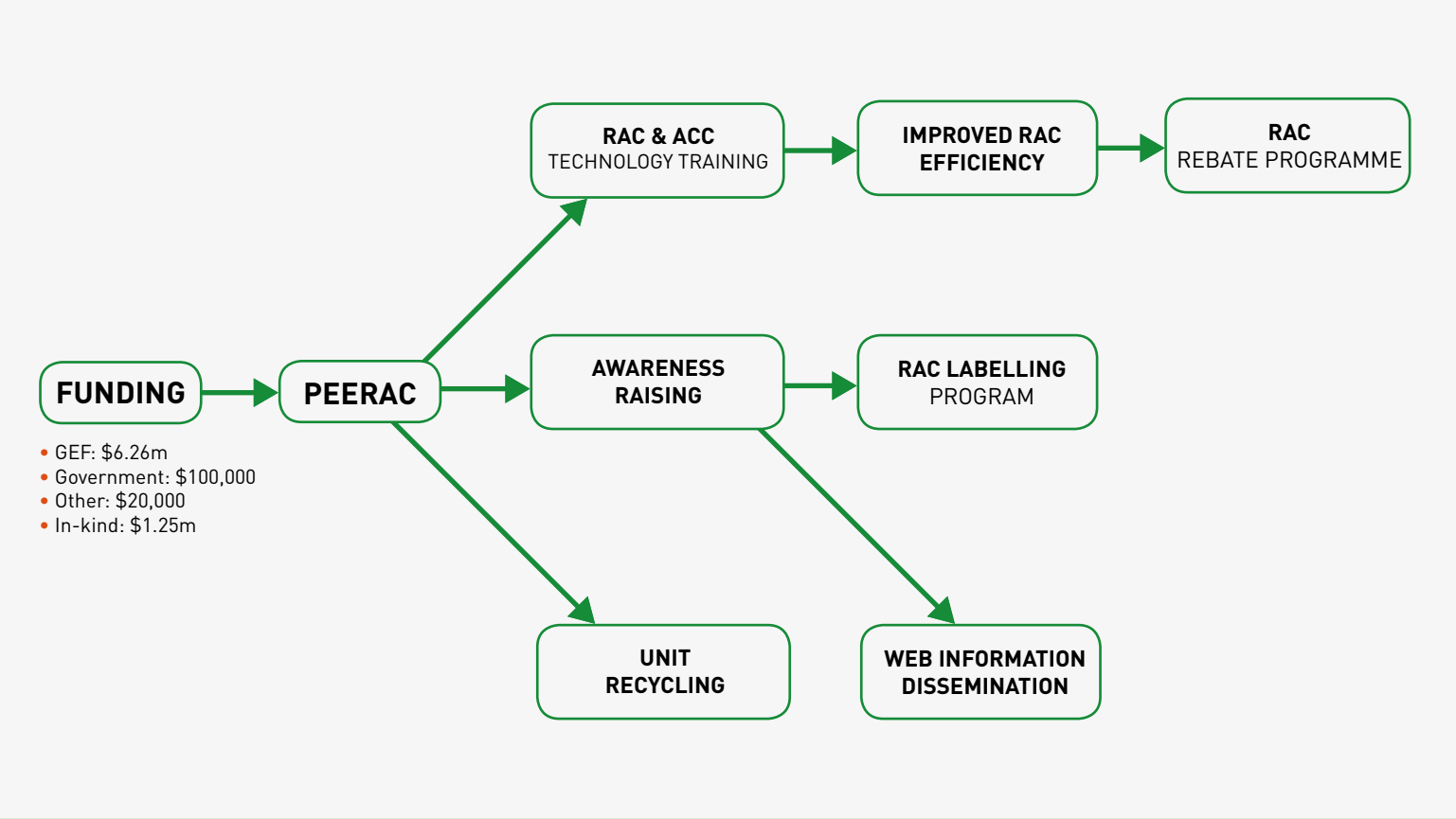
IDB are facilitating initial deployment of insurance for energy efficiency until it gains traction & is de-risked for banks to continue independently

Promoting Energy Efficient Room Air Conditioners (PEERAC) (UNDP, n.d.)

COUNTRY / REGION	**CHINA**				
GOALS	Reduction of GHG emissions from room air conditioners (RACs) in China's residential and commercial sectors.			**FINANCIAL PROVIDER**	• Global Environment Facility (GEF): US$6,263,600 • Government: $100,000 • Other: $20,000,000 • In-kind contributions: $1,250,000
OBJECTIVE	Improve energy efficiency of locally manufactured RACs by 10% based on 2007 levels from 2010-2014, thereby saving 940m tons of coal, and reducing CO_2 emissions by 35.4 million tons.			**FINANCING**	Credit line funded by GEF, Chinese government, other funding sources (China's Great Orient Chemical and Ministry of Agriculture) and in-kind contributions (RAC manufacturers)
TIMEFRAME	Programme period: 2008 TO 2015				
TOTAL SIZE	$27,613,600				
INVESTMENT: SIZE / RANGE	Undisclosed			**RESULTS**	ACC efficiency increased 13% and RAC efficiency increased 23% over project baseline (2.67%), exceeding 2012 target.
ACTIVITIES	• AC compressor (ACC) efficiency upgrades • RAC efficiency upgrades • Energy efficient (EE) RAC promotion • 20,000 inefficient RACs retired and recycled			**OBSERVATIONS**	The project was successful at facilitating efficiency upgrades to older units, and promoting energy efficient RACs in the domestic market. For successful dissemination of energy efficient units and to ensure savings were achieved, this programme required awareness raising and engagement to stimulate demand. This involved consumer education, public relations events, and preliminary work to enhance national energy efficient labelling to ensure information availability and consumer awareness.
ELIGIBILITY	Local RAC manufacturers. A variety of technology push and market pull projects were also eligible, e.g. technology training & labelling.				
IMPLEMENTING AGENCY	UNDP	**EXECUTING AGENCY**	Ministry of Environmental Protection (China)		

PROMOTING ENERGY EFFICIENT ROOM AIR CONDITIONERS (PEERAC)

FINANCIAL MECHANISM



- GEF: $6.26m
- Government: $100,000
- Other: $20,000
- In-kind: $1.25m

Promoting Energy Efficient Room Air Conditioners (PEERAC) (UNDP, n.d.)

1 Target market

Residential & commercial RACs

2 Drivers

GHG emissions reduction target; target to reduce unit GDP intensity by 20% 2005-10.

3 Supply chain

Increased capacity of technology manufacturers required to make energy efficient RACs available on the market at affordable cost; retailers and end-customers require awareness to ensure take-up

4 Barriers

Lack of familiarity with energy efficient technology & its benefits, lack of energy efficient standards, low technical capacity of manufacturers low market penetration of energy efficient RACs, high cost of RACs.

5 Solutions

Technology push:
ACC & RAC technology training & assistance; improved RAC efficiency & manufacturer incentive programmes.

Market pull:
Information dissemination, procurement promotion, energy efficiency RAC policy promotion, RAC labelling, consumer education, RAC rebate programme

6 Sustainability

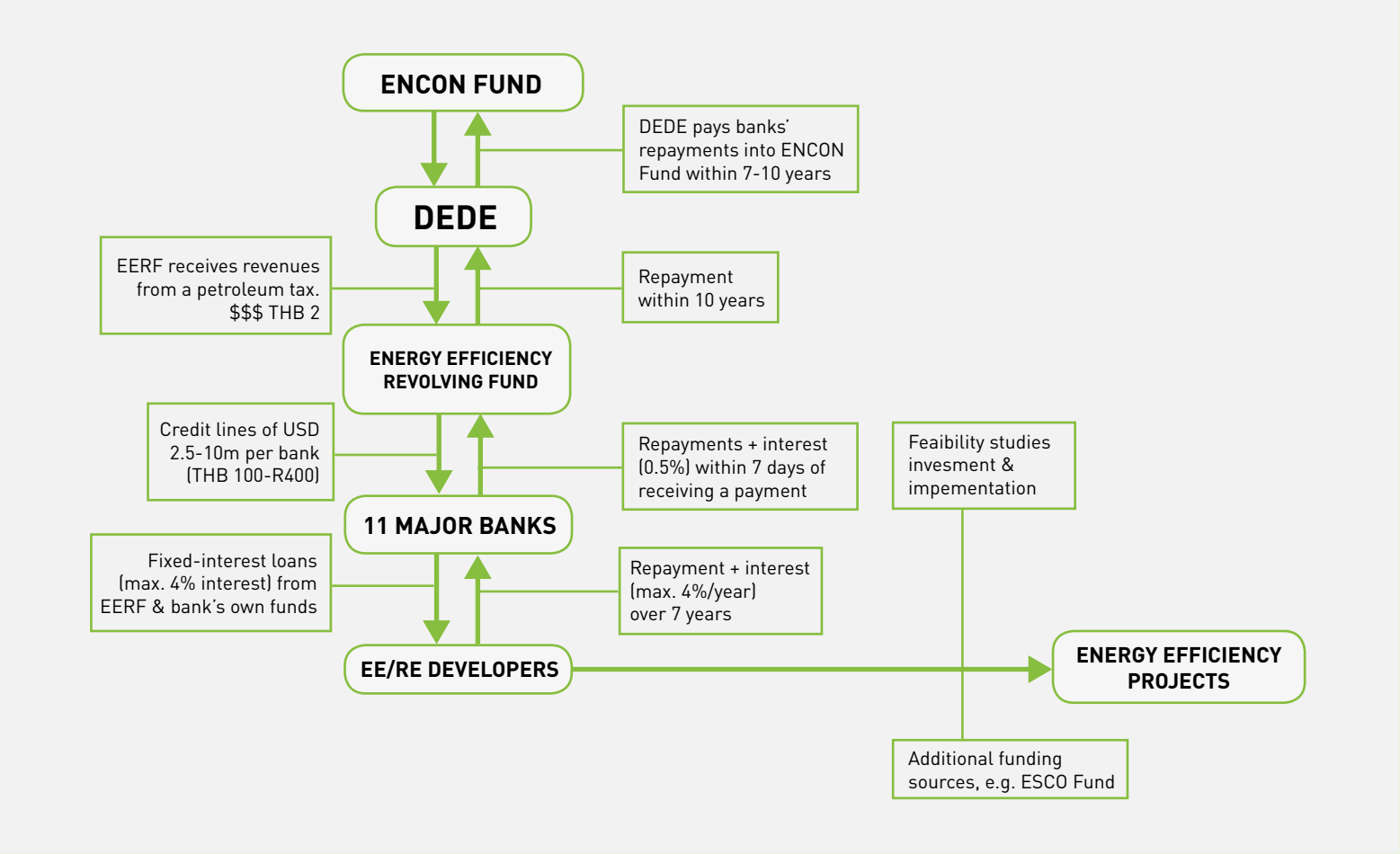
Improve local capacity in production of energy efficient compressors & ACs, increase energy efficient RACs in the market & enhance demand through consumer engagement & awareness.

Energy Efficiency Revolving Fund (Energy Futures Australia and DMG Thailand, 2005) (World Bank, n.d. (IIP, 2012) (Frankfurt School, 2012)

COUNTRY / REGION	THAILAND		
GOALS	Stimulate commercial financial sector investment in energy efficiency improvements and reduce oil imports & power demand.	PROGRAMME OPERATOR	Department of Alternative Energy Development and Efficiency with 11 major Thai banks.
OBJECTIVE	Involve Thai finance sector in providing access to capital via low interest loans for energy efficiency projects.	FINANCIAL PROVIDER	Government of Thailand through the Energy Conservation Promotion(ENCON) Fund, funded from capital derived from a petroleum tax.
TIMEFRAME	2003 TO 2013		
TOTAL SIZE	Initial fund size in 2003 was THB 2 billion (c. USD 63m) but reached USD 261m by September 2010, including USD 27.5m allocated for renewable energy projects.	FINANCING	EERF provide low-interest loans to banks, which finance energy efficiency projects through loans with favourable interest rates. EERF is funded from the government's ENCON Fund, which derives capital from a petroleum tax. EERF provides up to 50% of on-lent capital, with the remaining coming from the participating bank's resources.
INVESTMENT: SIZE / RANGE	Maximum loan of THB 50m per project (projects may constitute several separate energy efficiency measures). Maximum winterest rate 4% p.a.		
ACTIVITIES	Revolving fund with dedicated credit line to commercial banks to fund energy efficiency projects at low interest.	OBSERVATION	Simple and straightforward fund model can be applied to other countries. Take up of loans initially slow, so criteria were extended to broaden the target market and make loans available for SMEs. Broadening the scope of instruments supported would help capture a higher number of opportunities.
ELIGIBILITY	Eligible borrowers: buildings, factories, energy service companies (ESCOs) & project developers. Eligible projects: intially energy conservation & saving; later also renewable energy.		
PROGRAMME MANAGER	Ministry of Energy Department of Alternative Energy Development and Efficiency (DEDE)		

ENERGY EFFICIENCY REVOLVING FUND

FINANCING MECHANISM



Energy Efficiency Revolving Fund (Energy Futures Australia and DMG Thailand, 2005) (World Bank, n.d. (IIP, 2012) (Frankfurt School, 2012)

1 Target market

Industrial & commercial facility owners, ESCOs & energy efficiency / renewable energy project developers

2 Drivers

Government of Thailand objective to to reduce the energy intensity of Thailand's economy by 25% 2005-2025

3 Supply chain

Banks provided finance to end-customers for implementation of energy efficiency projects. Banks' awareness of energy efficiency opportunities, benefits and financial solutions for energy efficiency projects was lacking

4 Barriers

Lack of awareness of energy efficiency opportunities & benefits, limited access to capital, lack of interest & experience in energy efficiency financing among banks, excessive bureaucracy & paperwork for energy audits

5 Solutions

Low-interest loans to create demand; familiarise banks with opportunities; simplify procedures; and increase awareness

6 Sustainability

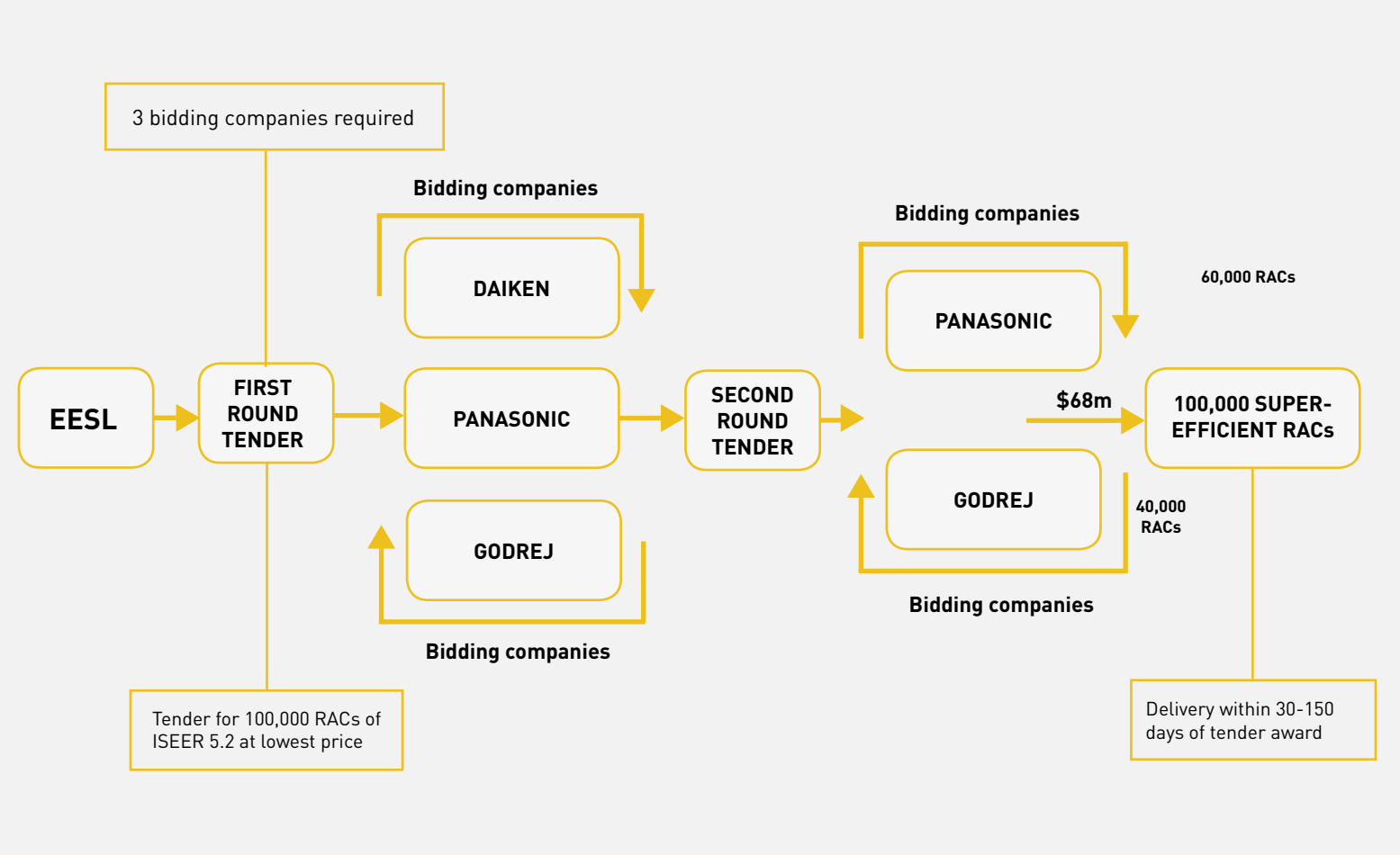
Capacity building: Commercial banks now familiar with energy efficiency financing and promote energy efficiency development to industrial and commercial customers. EERF stimulated invesment appetite of commercial banks to engage in financing energy efficiency projects.

EESL Super-Efficient Air Conditioning Programme (ESEAP)

COUNTRY / REGION	INDIA		
GOALS	Increase availability of affordable super-efficient room air conditioners (RACs) in India and Indian export markets (Bangladesh, Nepal, Sri Lanka)	FINANCIAL PROVIDER	EESL: joint venture company of Government of India Ministry of Power and Pubic Service Undertakings (PSUs). Supported by TERI, IGSD, TERRE and NRDC.
OBJECTIVE	Lower price and increase quality of super-efficient RACs using lower-GWP refrigerants by buying in bulk and streamlining distribution & installation.	FINANCING	First tender round in February 2017 for 100,000 RACs with Indian Seasonal Energy Efficiency Ratio (ISEER) of 5.2 or higher including 3-year comprehensive warranty. Indian Government requires at least 3 qualifying bidders. Second tender round where bidders can match the lowest bid to qualify for a portion of the bulk purchase.
TIMEFRAME	RAC tender: February 2017 (delivery expected 30-150 days after awarding)		
TOTAL SIZE	US$68m purchase to 100,000 super-efficient RACs		
INVESTMENT: SIZE / RANGE	Panasonic and Godrej & Boyce (Godrej) submitted final bid of Indian Rupee (INR) 44,320 (US$687.16) each for a total of 100,000 super-efficient RACs	RESULTS	Panasonic producing 60,000 super-efficient RACS, Godrej providing 40,000, at ISEER 5.2. EESL plans to purchase 500 more RACs similarly in the future.
ACTIVITIES	Competitive bulk procurement of super-efficient RACs	OBSERVATIONS	Builds on EESL's highly successful energy efficient street lamp replacement programme. However, procurement outcomes depend on the company response received. The complexity of bidding may discourage companies from participating. Provisions of splitting the purchase with companies who match the winning price may prevent the winning company from achieving economies-of-scale to make a profit.
ELIGIBILITY	Tender allowed use of ozone depleting GHG HCFC-22; ozone safe GHG HFC-410A & HFC-32; HC-290 (propane). RACs had to be 5.28kW (1.5TW) with ISEER of 5.2 or higher & include 3 year warranty.		
PROGRAM MANAGER & OPERATOR	EESL		

EESL SUPER-EFFICIENT AIR-CONDITIONING PROGRAMME

FINANCING MECHANISM



EESL Super-Efficient Air Conditioning Programme (ESEAP)

1 Target market

Room air conditioners in India and Indian export martkets

2 Drivers

Goverment of India energy efficiency targets

3 Supply chain

Air conditioning and refrigerant manufacturers develop energy efficient technologies, which are sold to end-customers. There is a gap in the supply of affordable technologies, with current energy efficient solutions sold at high cost to the consumer.

4 Barriers

Lack of availability of super-efficient RACs, high associated costs, percieved risk, challenges of installation & warranty

5 Solutions

Bulk procurement tender to lower cost of RACs compliment with ISEER 5.2 & increase market penetration.

6 Sustainability

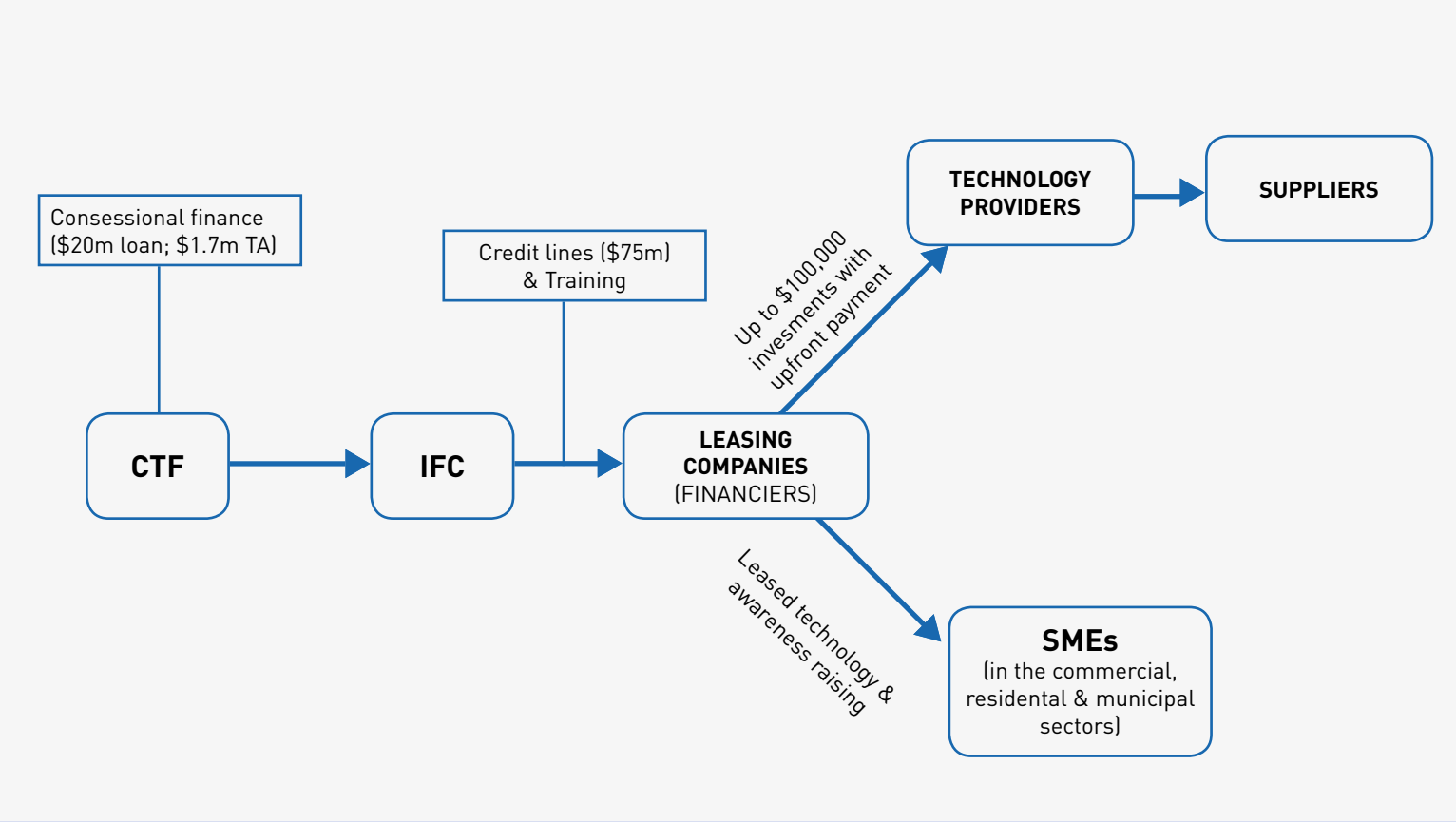
EESL builds trust & confidence in RAC manufacturers & incentivises the manufacturing scale necessary for affordable prices

Commercialising Sustainable Energy Finance

COUNTRY / REGION	TURKEY		
GOALS	Scale up energy efficiency (and renewable energy) to reduce expenditure on energy costs, improve competitiveness & move towards a sustainable energy supply.	FINANCE	IFC provided credit lines that were ring-fenced for energy efficiency investments to three leasing companies. These credit lines were blended with concessional CIF money to create attractive rates to incentivise utilisation. Leasing companies received technical assistance to help build their awareness, understanding and capacity for marketing and executing energy efficiency investments. Leasing companies would seek opportunities with SME clients before buying the necessary technology with the credit provided by IFC and CIF. Technologies were delivered to SMEs for a subscription fee.
OBJECTIVE	Develop energy efficiency leasing model to overcome SME barriers to financing energy efficiency measures.		
TIMEFRAME	4 years duration		
TOTAL SIZE	Concessional finance: $20m capital; $1.7m technical assitance	RESULTS	All funding was utilised and follow-on credit lines, without CIF concessions, have been sought and implemented by the leasing companies. In 2014, one leasing company sought a $96m loan from IFC on fully commercial terms, demonstrating financiers have skills and confidence to invest in energy efficiency. Over 50 energy efficiency projects were financed across the 4 years of the program, saving 0.2MtCO_2/year.
INVESTMENT: SIZE / RANGE	Up to $100,000 perinvesment		
ACTIVITIES	Energy efficient technology leasing: • **Operational leasing:** regular fee where end-users pay for equipment that is permanently owned by the leasing company. • **Capital leasing:** end-user pays a fee to the leasing company until they own it outright.		
ELIGIBILITY	SMEs in commercial, residential & municipal sectors. Requires targeted measures to achieve a minimum 15% energy efficiency improvement.	OBSERVATIONS	CSEF demonstrates that understanding the complexity and nuances of a local market is vital for success. Understanding the Turkish supply chain and barriers that SMEs faced enabled the construction of an effective solution package. This required knowledge of the supply chain circumstances and highlights the value of an in-depth market assessment prior to design. The success of the program demonstrates leasing to be an attractive option for scaling up EE markets, although it must be recognised that the Turkey market already has a developed leasing supply chain. Where this is not developed, leasing may be limited as a solution for EE.
PROGRAM MANAGER	IFC		
FINANCIAL PROVIDER	CTF		

COMMERCIALISING SUSTAINABLE ENERGY FINANCE

FINANCIAL MECHANISM



Commercialising Sustainable Energy Finance

1 Target market

SMEs in the commercial, residential & municipal sectors

2 Drivers

Economic policy to improve competitiveness; reduce dependency on energy imports; reducing exposure to business drivers are increasing energy bills and improving productivity

3 Supply chain

Leasing provided an off-balance-sheet solution in addition to de-risking the technology

4 Barriers

Fundamental barrier for SMEs was inability to take extra debt on their limited balance sheets

5 Solutions

Leasing companies had a strong incentive to expand and were an established avenue for reaching SMEs

6 Sustainability

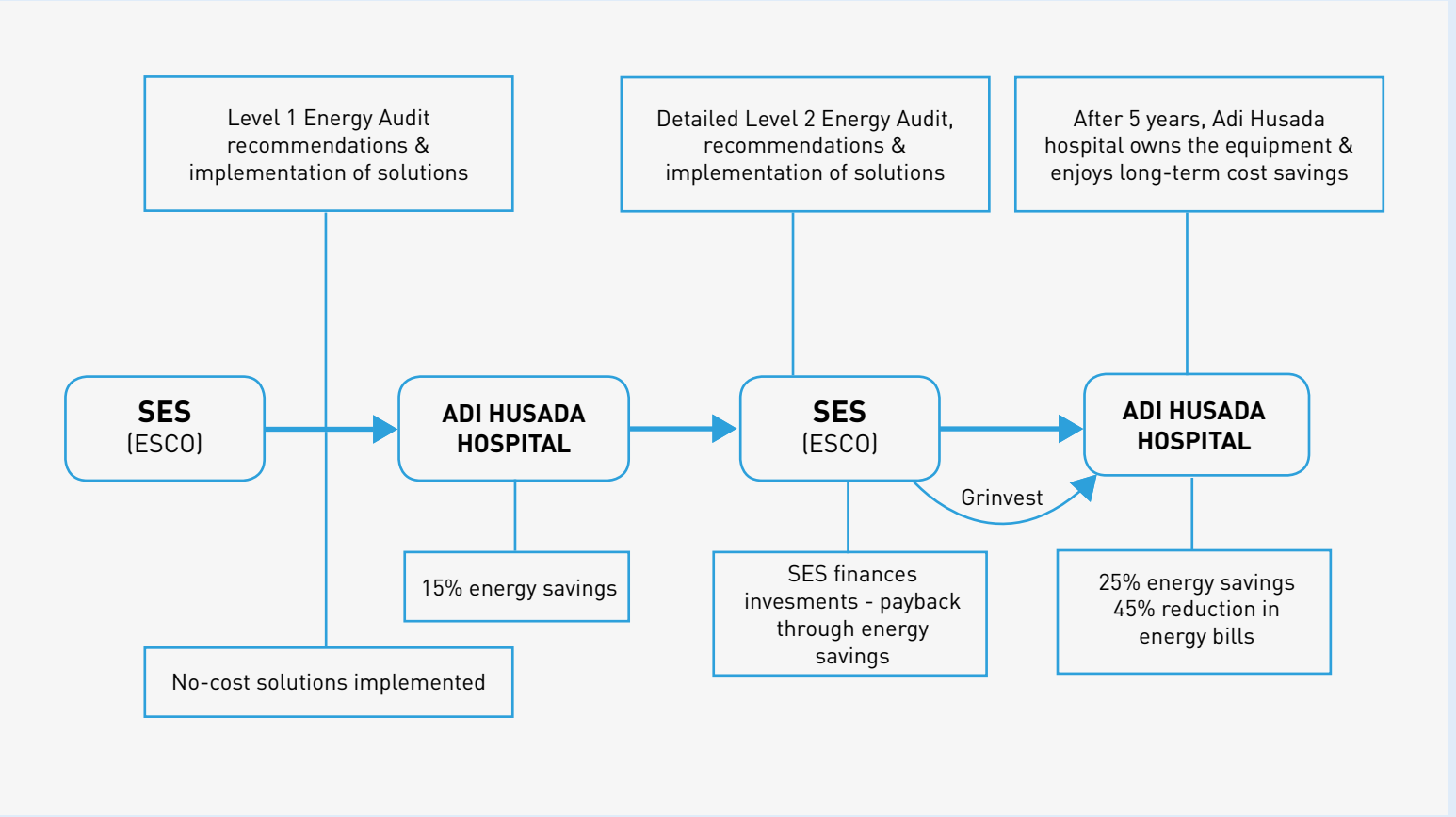
Follow-on credit lines with less or no concessions

Adi Husada Hospital (SES, Adi Husada Hospital - Energy Audit/ESCO, n.d.), (SES, 2016)

COUNTRY / REGION	**SURABAYA, INDONESIA**				
GOALS	To facilitate development of existing buildingsinto efficient, sustainable green buildings, to bring about energy savings.			**FINANCING**	ESCO business model, with compensation through energy savings. • The Level 1 energy audit involved no-cost investment. • The Level 2 energy audit required financial investment for implementation of solutions, and was financed through SES. SES operates a financing option called Grinvest, whereby SES takes over investments for complex upgrades, and is compensated with monthly cost-savings realised once the energy bill drops. This removes financial risk for clients, allowing risk-averse clients to implement energy efficieny measures. After 5 years, ownership of all the equipment will be handed over to the hospital and they receive 100% of the energy savings ongoing.
OBJECTIVE	To use ESCO financing for energy efficiency measures, to reduce energy costs and bring about financial savings in Adi Husada Hospital.				
TIMEFRAME	Not disclosed	**TOTAL SIZE**	Not disclosed		
PROGRAMME MANAGER	SES				
INVESTMENT: SIZE / RANGE	Dependent on the client's energy efficiency requirements			**RESULTS**	Total project energy savings = 40% (Level 1 energy audit = energy savings of 15% with no investment; Level 2 energy audit = energy savings of 25%, with investment from SES). Hospital bills reduced by 45%.
ACTIVITIES	• Energy audits • Energy saving solution recommendation • Solution implementation				
ELIGIBILITY	Existing buildings (e.g. hotels, hospitals or universities). Scope of work included steam system, domestic hot water, lights, cooling system, power quality, building envelope.			**OBSERVATIONS**	This mechanism had an immediate return on investment for the client as they were not required to invest. In Indonesia ESCOs are rare, and they are also rare in the cooling efficiency market, currently. ESCOs are better suited to clients with large, relatively consistent energy bills – such as hospitals – where the savings delivered are reliable and easy to measure. The ESCO model is more difficult to implement for a diverse customer base with fluctuating energy bills.

ADI HUSADA HOSPITAL

FINANCIAL MECHANISM



Adi Husada Hospital (SES, Adi Husada Hospital - Energy Audit/ESCO,n.d.), (SES, 2016)

1 Target market

Existing energy inefficient buildings (e.g. hotels, hospitals, or universities)

2 Drivers

Cost reduction and energy saving opportunities

3 Supply chain

Energy managers of existing buildings invest in energy efficiency measures, which are recommended and installed by experts/engineers. Current gap as energy managers discoursed by capital investment for solutions

4 Barriers

Lack of drivers or demand for energy efficiency. Operators averse to pursuing solutions that require financial investment. Lack of awareness of ROI benefits.

5 Solutions

ESCO business model means energy efficienct audits, reccomendations and solutions are either no cost or paid for by SES through Grinvest. Compensation is through energy bill reductions following retrofit (rather than paid hours of work.)

6 Sustainability

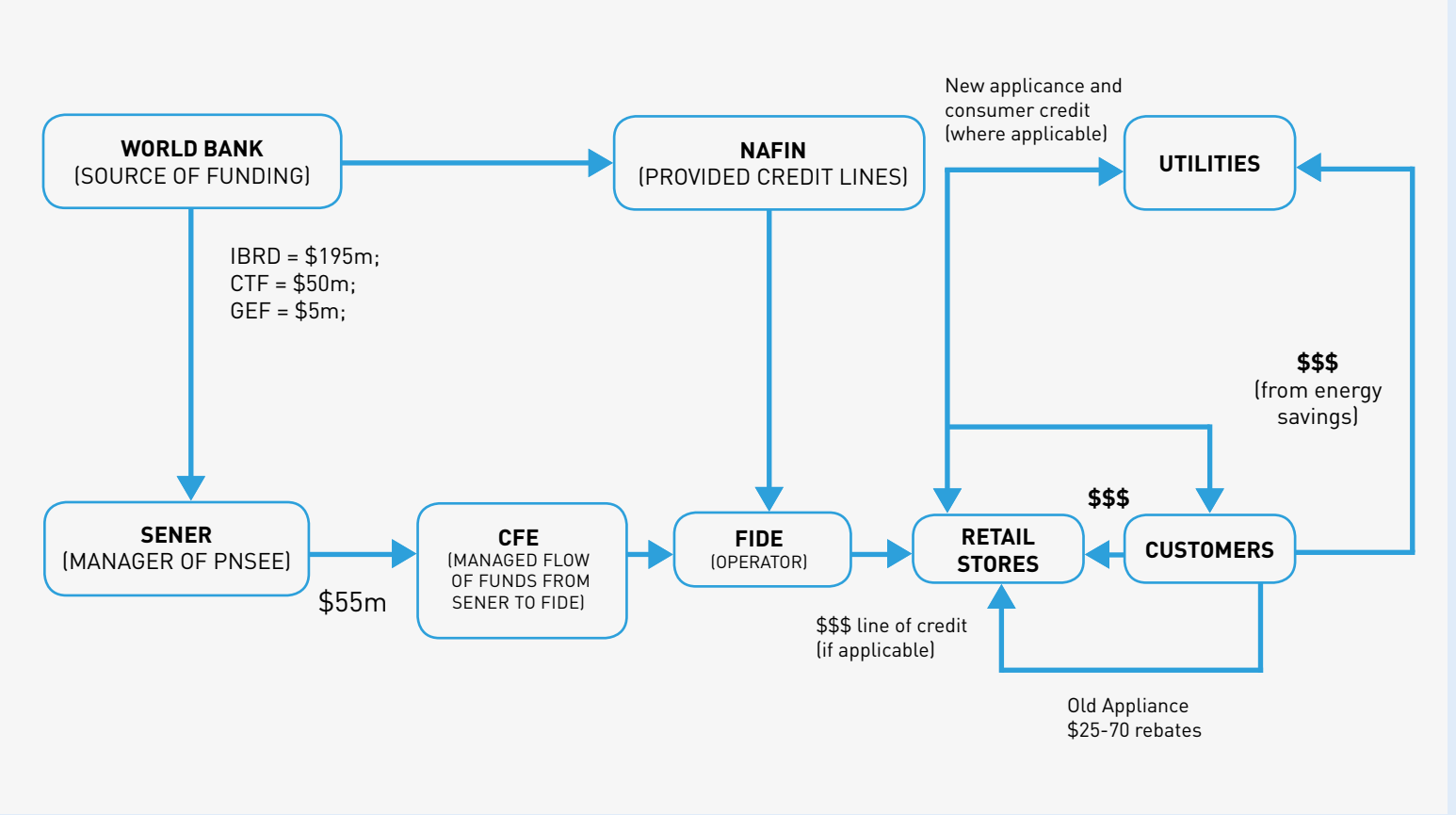
Follow-on credit lines with less or no concessions

Programa Nacional de Sustitución de Equipos Electrodomésticos (PNSEE) (Clean Energy Forum, 2017)

COUNTRY / REGION	MEXICO		
GOALS	Boost the economy, reduce poverty, and reduce GHG emissions	FINANCIAL PROVIDER	• Mexican Govt.: US$ 55m (including US$30m to capitalise the guarantee facility) • World Bank loans: NAFIN: U.S.$127m for consumer loans; IBRD: U.S.$195m; Clean Technology Fund (CTF): U.S.$50m to capitalize consumer loans
OBJECTIVE	Replace 1.7m refrigeration and AC units by 2012 (approximately 10% (170,000) of which will be ACs and 90% (1.53m) will be refrigeration units		
TIMEFRAME	2009 TO 2012	FINANCING	• Credit from NAFIN (Mexican development bank) at a lower interest rate • Repayments through monthly charges on participating customer's utility bills. Offset by electricity savings achieved. • A budget of US$30 per unit for collecting and recycling costs.
TOTAL SIZE	U.S. $600 million for appliance replacements (10% were ACs)		
ELIGIBILITY	Residential ACs & refrigerators (working & ≥10 years old, with cooling capacity ≥0.75 t)	INVESTMENT: SIZE / RANGE	Between $25 and $70 in appliance rebates available for end consumers; up to US$470 in financing for consumers, depending on monthly energy consumption
ACTIVITIES	Early replacement program, on-bill financing, refrigerant recycling	RESULTS	400GWh energy & 0.24 $MtCO_2$ saved by 2012; 1.5m refrigerators & 167,000 ACs replaced
PROGRAM MANAGER	Mexico Secretaría de Energía (SENER) (Ministry of Energy)	OBSERVATIONS	PNSEE provided more than 150,000 participants with more efficient appliances but a rebound effect actually led to increased energy consumption by 92kWh per year. This was as a result of pent-up demand for cooling - more efficient ACs result in lower energy bills and therefore cost less to use, so participants use them more to increase comfort levels. This can be a positive effect in developing nations for contributing to poverty alleviation although clearly is counter-productive in terms of energy consumption and emissions reduction. Replacement programs such as PNSEE successfully enable proper disposal of units and refrigerants, and so this model is effective in recycling and destroying high GWP HFCs.
PROGRAMME OPERATOR	Fideicomiso para el Ahorro de Energía Eléctrica (Electrical Energy Savings Trust)		

PROGRAMA NACIONAL DE SUSTITUCIÓN DE EQUIPOS ELECTRODOMÉSTICOS (PNSEE)

FINANCIAL MECHANISM



Programa Nacional de Sustitución de Equipos Electrodomésticos (PNSEE) (Clean Energy Forum, 2017)

1 Target market

Residential refrigerators & ACs

2 Drivers

Policy - reduce GHGs through MEPS; promote social inclusion.

3 Supply chain

Low income households had challenges to invest in EE equipment. Capacity of retail stores to provide technical solutions and credit to end customers for EE solutions needed building.

4 Barriers

Lack of awareness & demand for EE equipment; lack of finance (for some customers); potential re-use of old appliances

5 Solutions

Rebates/vouchers & financing for clients investing in MEPS -compliant equipment. Mandates/budget for recycling old kit

6 Sustainability

Stimulate domestic demand for EE mandatory replacement & recycling of old units

CONCLUSION

The preceding case studies give a flavour of the wide range of energy efficiency finance and support schemes currently operating globally. General reflections regarding each of the financial mechanism design features used in these programs are given in Table 1.

Table 1 - Reflections on common energy efficiency finance mechanisms

FINANCE MECHANISM	KEY BARRIERS ADDRESSED	REFLECTIONS	EXAMPLE
Leasing (operating and capital): **Operating lease:** Contract for using an asset – ownership responsibilities lie with lessor (rental). **Capital lease:** Contract for using an asset where ownership responsibilities effectively transferred to lessee.	• The high upfront costs of energy efficient equipment. • A lack of awareness/trust from end-users in energy efficient technology. • Unwillingness/inability of end-users to secure finance against their limited collateral.	• Highly impactful in sectors where access to finance is difficult (e.g. where target consumers have limited collateral or poor credit history). • Particularly successful at targeting the hard-to-reach SME sector.	• Commercialising Sustainable Energy Finance (Turkey)
Insurance: A contractual obligation for SMEs to be reimbursed if the performance of the technology is below set expectations. This could underpin the guarantee of repayments for unfamiliar technologies such as some used to deliver higher energy efficiency.	• Perceived high technology risk discourages lenders from financing particularly longer payback energy efficiency projects. • Energy efficiency is not a top business priority for end-users, and they can be sceptical about their savings potential.	• Can mitigate high perceptions of risk on the behalf of financiers (like a guarantee) and end-users (unlike a guarantee). • Encourages banks and consumers to invest in upgrades with longer payback periods and/or that could involve high upfront cost.	• Energy Savings Insurance (Mexico, Colombia, El Salvador)

FINANCE MECHANISM	KEY BARRIERS ADDRESSED	REFLECTIONS	EXAMPLE
Guarantee: A mechanism that acts as a reserve for losses incurred by financiers lending to relevant projects. This is often provided for a premium that the beneficiary has to pay. The presence of donor funds may enable the facility to be provided at a concessional rate or underwrite the first losses with grant finance that expects no return.	• Poor creditworthiness of clients requiring finance, who often lack the collateral or revenue streams to secure a loan. • Financial institutions may be reluctant to finance energy efficiency projects that are unfamiliar to them and especially so if the lending is to a higher credit risk group such as SMEs, which often lack a track-record of successful borrowing and repayment and/or lack collateral. If guarantees help encourage financial institutions to offer unsecured lending, they may tackle the lack of energy efficiency project financing available.	• Needs careful design to ensure it is effective at de-risking energy efficiency ventures. • Concessional terms facilitated by donors often crucial to success. • Effective for incentivising lenders in markets where energy efficiency is not familiar. • Prior capacity building in energy efficiency will improve effectiveness of guarantee. • Requires strong and liquid banking sector to provide its own credit. • Must be simple – cost and requirements can be onerous and off-putting for banks.	• Sustainable Energy Finance Program (Philippines)

FINANCE MECHANISM	KEY BARRIERS ADDRESSED	REFLECTIONS	EXAMPLE
Credit line: Injection of capital from a donor, multi-lateral development bank (MDB), government or private institution, to a financial intermediary who is able to on-lend to their clients. Provides a ring-fenced source of capital that incentivises lending, particularly when provided at concessional rates or when facilitating unsecured lending.	• Financial institutions lacking liquidity (short and long-term) and/or inclination to invest in energy efficiency projects.	• On-lending often requires a well-established financial sector. • Concessional to trigger a market; non-concessional to sustain a market. • Needs strong, stable banking sector with relationships with the target market and across the supply chain. • Requires technical assistance throughout supply chain – lack of lending is not always due to lack of available capital.	• Sustainable Energy Financing Facilities (multiple countries including most of Eastern Europe, Morocco, and Egypt).

FINANCE MECHANISM	KEY BARRIERS ADDRESSED	REFLECTIONS	EXAMPLE
On-bill financing: Integrating investment costs with pre-existing bills, where energy savings prevent the former exceeding the latter over the payback period.	• The lack of upfront capital and lack of trust in energy savings as value for property owners.	• Hassle-free regular repayment plan that can be subsumed into normal energy bill or tax payments – supporting take-up. • Trust in institutions providing finance is important for ensuring participation.	• Property-Assessed Clean Energy (U.S.)

FINANCE MECHANISM	KEY BARRIERS ADDRESSED	REFLECTIONS	EXAMPLE
Rebates, incentives, or subsidies: Temporarily make the business case for energy efficiency more attractive through financial concessions or compensation to encourage the demand for energy efficiency projects and/or the supply of finance for energy efficiency investments.	• Costly and time consuming project development processes. • High transaction costs and small scale (and therefore limited prize) of energy efficiency projects. • High up-front costs of energy efficiency technology • Unfavourable prioritisations between energy efficiency and other business priorities. • Unappealing payback periods.	• Generate demand for investing in energy efficiency and for accompanying finance. • Can offset effect of energy subsidies (which dampen interest in energy efficiency).	• Scheme for Technology and Quality Upgradation Support to MSMEs (India)

FINANCE MECHANISM	KEY BARRIERS ADDRESSED	REFLECTIONS	EXAMPLE
Revolving fund: Any repayable investment vehicle whereby the repayments and/or proceeds of initial investments are reinvested in further eligible projects.	• Lack of capacity or inclination to invest in energy efficiency in the supply chain or local financial sector.	• Can magnify the amount of capital injected into the market, particularly if combined with criteria limiting the term of individual investments. • Can lead to the market being dominated by, or reliant on, the revolving fund entity, rather than building broader capacity in the financial sector or technical supply chain.	• Energy Efficiency Revolving Fund (Thailand)

FINANCE MECHANISM	KEY BARRIERS ADDRESSED	REFLECTIONS	EXAMPLE
Energy Service Companies (ESCOs): Companies that provide customers energy savings solutions that pay for themselves (and provide a return to the ESCO) through the savings on energy bills they generate. The ESCO typically guarantees the performance of energy efficient solutions and may or may not provide customers directly with finance for the investment.	• Lack of familiarity and trust from end-users and investors in energy savings. • Difficulties or disinclination to join different elements of the technical and financial supply chain to realise solutions.	• The ESCO model is best suited to sectors with large and consistent energy bills – for example, municipalities or large energy intensive industries. • In contrast, for SME markets with their relatively small, less predictable energy bills ESCOs are less suitable. • ESCOs often lack their own collateral, preventing them accessing debt financing for growth. • The inherent unfamiliarity and complexity of their business model to end-customers can also limit take-up.	• PROESCO (Brazil).

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