

Application of the ICAT Buildings Efficiency Guide in Indonesia



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ICAT Initiative for
Climate Action
Transparency

Initiative for Climate Action Transparency - ICAT

Application of the ICAT Buildings Efficiency Guide in Indonesia

Deliverable #1

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Executive Summary

As outlined in the enhanced Nationally Determined Contribution (e-NDC), Indonesia is committed to mitigating climate change by reducing emissions up to 31.89% and 43.20% with international support by 2030.

Align with the commitment, the government of Indonesia through the Ministry of Public Works and Housing has implemented the Minister Regulation No. 21/2021 on Green Building Performance Rating. This regulation demonstrates the government's good will in aiding the nationwide endeavour to increase building efficiency, to conserve energy and reduce GHG emission across different building, residential, and regional scales.

This UNOPS supported study seeks to assess the impact of the Ministry of Public Works and Housing No. 21/2021 on GHG emissions using a standardized methodology developed by the Initiative for Climate Action Transparency. Additionally, the study assesses the impact of the initiative from the Ministries of Energy and Mineral Resources, the Subroto Award for Energy Efficiency (PSBE), using transformational change guide. The study is still undergoing. This initial report presents an overview of the assessment process that is being carried out. It forms part of Deliverable #1 of the project. The report is made up of the following sections:

- Plan of the assessment process: stakeholder identification
- Identification of data gaps, needs and impacts, remedial solutions
- Project implementation plan that leverage assessable resource

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Abbreviation

ASEAN	Association of Southeast Asian Nations
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
BAU	Business as usual
BPS	Statistics Indonesia
Bappenas	National Development Planning Agency / Ministry of National Development Planning
CLASP	Collaborative Labeling and Appliance Standards Program
CM1	Counter Measure 1 (unconditional mitigation scenario)
CM2	Counter Measure 2 (conditional mitigation scenario)
ESCAP	United Nations Economic and Social Commission for Asia and the Pacific
GBCI	Green Building Council Indonesia
GDP	Gross domestic product
GHG	Greenhouse gas
GWh	Gigawatt-hour
GWP	Global warming potential
ICAT	Initiative for Climate Action Transparency
km	Kilometre
kWh	Kilowatt-hour
MA	Ministry of Agriculture
MCI	Ministry of Communication and Information
MEF	Ministry of Environment and Forestry
MEMR	Ministry of Energy and Mineral Resources
MEPS	Minimum energy performance standard
MMAF	Ministry of Marine Affairs and Fisheries
Mol	Ministry of Industry
MoL	Ministry of Labor
MoT	Ministry of Trade
MoTrans	Ministry of Transportation
MW	Megawatt
MWPH	Ministry of Public Works and Housing
NCAP	National Cooling Action Plan
NDC	Nationally Determined Contribution
SDG	Sustainable Development Goal
SNI	Indonesian National Standards
TR	Ton of refrigeration
UNEP	United Nations Environment Programme
UNOPS	United Nations Office for Project Services
VRF	Variable refrigerant flow
W/W	Cooling energy (watts) / electrical energy (watts)

1. Plan of the assessment process

1.1 Stakeholder identification

The initiative to increase building efficiency and reduce emission impact in Indonesia, will involve many stakeholders derived from multiple backgrounds, whose roles can influence the initiatives relevant to this project. In this section, several stakeholders are identified whose credibility and status may have impact to the project. They are listed in Table 1.

Table 1 Stakeholders Identification for Building Efficiency in Indonesia

Stakeholders	Roles in Building Efficiency Initiative
Public Sector at National Level	
Ministry of Public Works and Housing (MPWH)	Leading ministry in building sector, who is responsible for formulation, implementing, and monitoring national policies related to buildings in Indonesia. MPWH issued the green building regulations, called Permen PUPR No. 21 Tahun 2021, which is the main policy assessed in this project.
Ministry of Energy and Mineral Resources (MEMR)	Leading ministry in energy sector, responsible for monitoring and developing strategies on energy transition, namely the use of renewable energy and implementation of energy efficiency. MEMR also boost the initiative to enhance energy efficiency in building sector through PSBE (Penghargaan Subroto Bidang Efisiensi Energi). This award recognizes building owners or managers with outstanding achievements in energy efficiency.
Ministry of Environment and Forestry (MoEF)	Leading ministry responsible for coordinating activities related to climate change; MoEF is the institution responsible in developing Indonesia eNDC, in which GHG emissions reduction is the main topic outlined, and MoEF is responsible any GHG emissions reduction initiatives in every sector, including buildings.
Public Sector at Regional/Local level	
Local Governments	Responsible for distributing, allocating, and managing yearly Anggaran Pendapatan dan Belanja Daerah or APBD (local budget and expenditure) including budgeting for the governmental or public building sub-sectors in the region.
Local Planning Agencies (BAPPEDA)	Responsible for elaborating national into regional mid-term development plans to serve as planning guidelines for sectoral offices in the local governments, including budgeting.
Local City Landscape / Spatial Offices (Dinas Tata Kota) at Provincial Level	Responsible for managing the construction and spatial planning of buildings in the region, in line with government regulations

	regarding regional building sector management, including building efficiency.
Local Environmental Agencies (BPLHD, BLH)	Responsible for environment-related activities as mandated by MoEF, including managing and supervising any effort on GHG emissions reduction
State-Owned Enterprises	
National Electricity Company (PLN)	Most of buildings in Indonesia used on-grid electricity, where PLN is the only institution (company) rightful to distribute on-grid electricity to users.
National Residence (PERUMNAS)	A state-owned enterprise in Indonesia focused on national housing development. It is a public company where all shares are owned by the government and plays a crucial role in urban development.
National Developers & Contractors (WIKA, WASKITA, Adhi Karya, etc.)	These stakeholders are developers and contractors, responsible for carrying out procurement and construction of new infrastructures, including large scale buildings across Indonesia.
Private Sectors	
Building or Property Developers and Contractors	Large- and small-scale developers and contractors implementing design, procurement, and construction of office buildings, apartments, houses, etc.
Building Utility Suppliers <ul style="list-style-type: none"> - Mechanical (AC, heating appliances, building transportation systems, etc.) - Electrical (transformers, panels, cables, etc.) - Plumbing (pump, piping, valve, etc.) - Lighting 	GHG emission reduction initiative will trigger this stakeholder to develop more eco-friendly utilities, for instance, air conditioner with green refrigerant, high efficiency motors, LED lamps, etc, which contribute directly to decarbonization in building sector.
Building Management Company	Most large-scale buildings have building managers who are responsible for managing the energy uses of the building, including conducting maintenance, repair, and monitoring of all energy appliances inside the buildings.
Consulting firms	Performing consultancy services on buildings, e.g. energy audit, HVAC technical assessments, power quality analysis, etc.
Development Agencies	
C40 CITIES	C40 Cities is a global network comprising nearly 100 mayors from leading cities around the world (including Jakarta) that are committed to addressing the climate crisis through joint actions and initiatives, with building topics become one of the priorities.

Indonesia Climate Change Trust Funds (ICCTF)	Established by the Government of Indonesia as a national trust fund aimed at supporting emissions reduction and promoting low carbon development initiatives.
Indonesia Business Council for Sustainable Development (IBCSD)	An association led by CEOs of various companies operating in Indonesia that focuses on promoting sustainable development through sustainable economic growth and ecological responsibility, adhering to the Sustainable Development Goals (SDGs) as a guiding framework.
Expert Organizations (related to buildings)	
ASHRAE - Indonesia	ASHRAE Indonesia's mission is to advance the arts and sciences of HVAC and refrigeration, aiming to create a healthy and sustainable built environment. The chapter serves as a platform for information and communication about refrigeration, heating, ventilation, and air conditioning (RHVAC) in Indonesia.
Building Engineers Association – Indonesia	Professional organization for building engineering experts in Indonesia. Provides training and certification for members, fosters a managerial spirit in engineering, and promotes awareness of regulations related to building management.
GBCI (Green Building Council Indonesia)	GBCI was established to promote sustainable building practices in the country. It operates through collaboration among various stakeholders, including professionals in the construction sector. GBCI also develops certification systems aimed at assessing and promoting green building initiatives.
IABHI (Ikatan Ahli Bangunan Hijau Indonesia)	IABHI or the Indonesian Green Building Experts Association, is a professional organization dedicated to promoting green building practices and sustainability in the built environment in Indonesia. IABHI's activities include providing training and certifications, raising awareness on environmental issues, advocating for sustainable practices, and helping align the construction industry with eco-friendly standards and regulations.
A2RTU	An association in Indonesia aimed at advancing the fields of refrigeration and air conditioning through studies, research, and training. A2rtu also plays an important role in advocating for sustainable and energy-efficient practices, especially considering Indonesia's growing demand for cooling and climate control solutions in both residential and commercial buildings.
Academic Institutions	
State and Private Academic Institutions	Academic Institutions, especially in engineering field, includes studies and research on building sectors, in which green

	building become part of the research focus, starting from green design, green materials and appliances, and innovative energy efficiency measures.
Non-Government Organizations, Communities, and Media	
Non-Governmental Organizations related to building, energy, or environment	Play important roles as multipliers and raise awareness of building efficiency at both national and local levels.
Communities related to building, energy, or environment	Communities who have concerns on environment, including green building scattered across regions in Indonesia, holding meetings, discussions, and environmental campaign, e.g. through social media.
Local, national, and international media	Campaign for awareness-raising on building efficiency.

1.2 Stakeholder mapping

Stakeholders are identified in accordance with ICAT Stakeholder Participation Assessment Guide where all stakeholders are affected by and influence the project, during the project works as well as completion. We identify the stakeholders based on our experiences in conducting typical research and consultancy projects related to renewable energy and building efficiency, as well as data availability and documents issued. Moreover, we also understand each stakeholder profile and characteristic related to the policies in terms of knowledge about the policies, relationship with the policies, policies effect on them, ability to enhance or hinder the policies, mutual relationships and interest, expectation, willingness, and types of organization they are in. It is depicted in Figure 1.

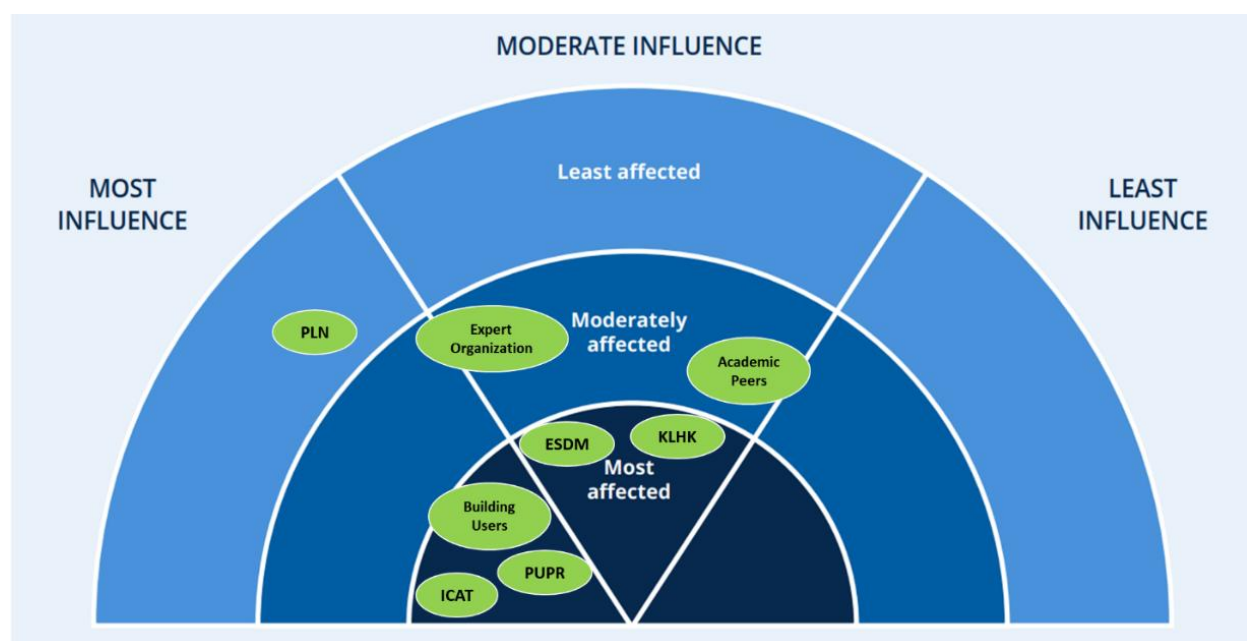


Figure 1 Stakeholder mapping

We categorize the stakeholders based on their influence on the project, and how the project will impact their organization.

1. Key Stakeholders

a. UNOPS – ICAT

UNOPS - ICAT is the owner and the funder of this project whose interests are to seek organization (in this case Universitas Indonesia or UI) to apply the ICAT series of policy assessment guides in developing countries, and Indonesia is one of the representatives. This project aims to target government of Indonesia (GoI) and their partners that are planning and implementing policies, and/or assessing their impacts in the context of developing and implementing their NDCs, national or subnational low carbon strategies, nationally appropriate mitigation actions, and other mechanisms.

UNOPS – ICAT has significant influences on this project, since most of the policy impact assessments will follow the guides, previously developed by UNOPS - ICAT. Aside from the “formal” guidance from the assessment guide document, UNOPS – ICAT as the project owner will have authority to decide the path of the project, in which UI, represented by our team, will carry out each activity and develop deliverables as required in the ToR.

The works and completion of this project will significantly impact UNOPS – ICAT team, by providing feedback on the assessment guide as well as giving insights about implementation of building efficiency in Indonesia, as one of the representatives of developing countries.

b. Ministry of Public Works and Housing

Specifically for this project, the GoI is represented by Ministry of Public Works and Housing (MPWH/PUPR) who issued a regulation of *Permen PUPR No. 21 Tahun 2021* about green buildings, as the most relevant national reference in carrying out the policy impact assessment on building efficiency.

PUPR has major influence on this project, as the policy (*Permen PUPR No. 21 Tahun 2021*) maker. Moreover, the selection of building types will highly consider the recommendation from PUPR, in which PUPR possibly have priority buildings included in their national strategic project.

The policy impact assessment conducted in this project will become lesson learned by PUPR to improve regulations especially in technical aspect of including more detailed consider on building decarbonization in Indonesia. In other words, this project will greatly refine and improve PUPR in issuing forthcoming regulations.

c. Building Users

Building users, in this context, refer to the building managers and owners, where the policy impact assessment will be conducted in their buildings. Furthermore, different types of building users will have distinct intention regarding this project. For instance, residential building users may only focus on energy efficiency approach, since it will directly bring electricity cost saving for them. Meanwhile, commercial building users' motives may also include both energy efficiency and GHG emissions reduction, since the former leads to cost savings, while the latter can become portfolio as a climate change mitigation action, especially for buildings managed or owned by government (governmental or state-owned buildings).

The building users selected should be those who have implemented *Permen PUPR No. 21 Tahun 2021* on their buildings. The policy impact assessment will highly rely on the historical data of the buildings, mainly related to energy consumption and GHG emissions. Thus, the building users will have a significant impact on the smoothness

of the project, especially on their cooperation in providing required data and the completeness of the data themselves.

The impact of policy impact assessments on the building users is that it can become a criteria to analyze their efforts to participate in achieving the country's NDC. On the other hand, the results of the assessments can become a basis for the building users in developing future strategies to further reduce both energy consumption and GHG emissions. In other words, the policy impact assessment will help the users to make their buildings more efficient.

2. Non-key Stakeholders

a. The Ministry of Energy and Mineral Resources

The Ministry of Energy and Mineral Resources (MEMR/ESDM) is the frontier ministry in supporting GOI to achieve NDC target, by issuing policies and regulations related to energy transition, renewable energy, and energy efficiency. Specifically in the context of energy efficiency, ESDM plays a critical role in planning national energy targets. The influence of ESDM in this project is to provide deeper insights on energy efficiency, especially that which is related to buildings. The data or project cases (which can be disclosed) by ESDM can provide more comprehensive understandings to UI team in carrying out the assessment. On the other hand, this project will directly impact ESDM by providing more perspectives on energy savings actions, specifically in the building sector, which can contribute to refine ESDM policies or regulations in the future.

b. Indonesia National Electricity Company

Indonesia National Electricity Company (PLN) plays significant roles in this project, since main energy supply of the buildings derived from electricity. Moreover, in Indonesia, most energy regulations or policies issued by ESDM, especially in electricity, are mandated to PLN as the only electricity supplier in Indonesia. Furthermore, in Indonesia, the Independent Power Producer companies must sell their electricity to PLN for on-grid purposes, making PLN the only on-grid electricity "owner" to regulate, monitor and distribute electricity for users. The study case of this project can give insights for PLN to oversee the direct impact (in terms of energy savings and GHG emissions reduction) of building efficiency realization in building users.

c. Ministry of Environment and Forestry

The Ministry of Environment and Forestry deals with greenhouse gas emissions in various sectors, including building. In fact, most of LTS-LCCR (mentioned in the technical proposal) are mainly developed by KLHK to support Indonesia in achieving their NDC targets. The work on estimating GHG emissions in this project will surely be influenced by and impact KLHK. The publicly accessible data and project cases from KLHK can provide information for the UI team to commence the project. Moreover, the dissemination session of this project will invite KLHK to engage them as the Gol representative who mainly deals with the GHG matters in the country.

d. Expert Organizations

Expert organization will be invited during Focus Group Discussion (FGD) in dissemination session to present the selected case study and gain feedback on it. The participation of expert organization is necessary since they have notable experiences in conducting research, studies or projects related to renewable energy and building efficiency for buildings in Indonesia. UI team proposes to invite expert organizations from:

- ASHRAE – Indonesia Chapter

American Society of Heating, Refrigerating and Air-Conditioning Engineers – Indonesia Chapter (AIC) was established on November 27, 2007. As of 2018, this organization has 205 members who work collaboratively in HVAC&R, energy efficiency, indoor air quality, and sustainability in the building industry. The access to global networks surely gives AIC the extensive technical resources, including standards, guidelines, handbooks, journals, software, and mobile applications, which are utilized by various stakeholders involved in HVAC&R for the built environment. The organization regularly reviews, revises, and republishes its standards to address evolving industry needs and concerns.

- Green Building Council Indonesia

Green Building Council Indonesia (GBCI) an independent not for profit organization founded in 2009 by leading professionals and companies in the building industry in Indonesia. Our main mission is to transform market and industry players to be more responsible and sustainable. We have four main programs namely Rating Development, Training and Education, Green Building Certification and Stakeholder Engagement.

- Building Engineers Association Indonesia

Building Engineers Association Indonesia (BEAI) is professional organizations comprises of Indonesian building engineers. The main activity of BEAI includes providing training, capacity development and certifications for its members to be qualified as certified and credible experts in building engineering. BEAI also conducts events to socialize and disseminate government regulations, standards, and knowledge related to building engineering aspect, which mainly includes building efficiency.

- Air Conditioning Experts Association

Air Conditioning Experts Association - *Asosiasi Ahli Refrigerasi dan Tata Udara* Indonesia (A2RTU) is an association aims to collect, develop, and advance refrigeration and air conditioning techniques in Indonesia through study, research, training, mediation, advocacy and discussion in the field of refrigeration and air conditioning for the better benefit of the Indonesian people.

- Green Building Experts Association

Green Building Experts Association - *Ikatan Ahli Bangunan Hijau Indonesia* (IABHI) is an organization serves as platform for communication, consultancy, coordination, and capacity development that unify green building experts, practitioners, private or public institutions both from national and international level.

e. Academic Peers

During study case development, peer-reviews are necessary to improve the case study. We propose peers from national and international for technical reviews of the study case with supporting feedback and credible advisories since the peers are those experienced in building efficiency.

2. Identification of data gaps, needs and impacts, remedial solutions

For analysis in baseline scenario, there are some data relevant which collected from Green Building Secretariat at the Ministry of Public Works Indonesia. Table 1 below lists specification data and potential source for GHG baseline emission calculation in Indonesia regarding ICAT Guideline for Building Efficiency.

Table 2 Data Requirement for ICAT Guideline for Building Efficiency Baseline GHG Emission

No	Data Parameter	Unit	Coverage	Potential Data Sources
1	Number of buildings per building type in climate zone up to year	Integer	National (which use PUPR Regulation)	
	Existing buildings			<ul style="list-style-type: none"> - National, subnational or municipal statistics bureaus (i.e., can include statistics from census or household surveys, tax or property databases (for building information), energy databases (for building energy use data)) - Related studies in the field - Expert judgment
	Retrofitted buildings			<ul style="list-style-type: none"> - National, subnational or municipal statistics bureau - Related studies in the field - Expert judgment
	New buildings			<ul style="list-style-type: none"> - National, subnational or municipal statistics bureau - Related studies in the field - Expert judgment
2	Average annual specific energy use per m ² by building type in climate zone up to year	kWh per m ²	For Building which use PUPR Regulation	<ul style="list-style-type: none"> - National, subnational or municipal statistics bureau (can include statistics from surveys like census or household survey), tax or property databases (for building information), energy databases (for building energy use data)) - Related studies in the field

				- Expert judgment
3	Share of energy carrier in fuel mix	(% of total fuel mix)	For Building which use PUPR Regulation	<ul style="list-style-type: none"> - National, subnational or municipal statistics bureau (can include statistics from census or household surveys, tax or property databases (for building information), energy databases (for building energy use data)) - Related studies in the field - Expert judgment
4	Average floor area per building-by-building type in climate zone up to year	m ² per building	For Building which use PUPR Regulation	<ul style="list-style-type: none"> - National, subnational or municipal statistics bureaus (i.e.,can include statistics from census or household surveys, tax or property databases (for building information), energy databases (for building energy use data)) - Related studies in the field - Expert judgment
5	Energy carrier emission factors	g CO ₂ per kWh	For Building which use PUPR Regulation	<ul style="list-style-type: none"> - National, subnational or municipal statistics bureaus (i.e.,can include statistics from census or household surveys, tax or property databases (for building information), energy databases (for building energy use data)) - Related studies in the field - Expert judgment

Also for further analysis in Ex-Ante and Ex-Post GHG Emission analysis for building we identified the data requirement below at Table 2 regarding Regulation of Minister of Work Number 21 Year 2021.

Table 3 Data Requirement for Ex-Ante and Ex-Post GHG Emission

No	Data Type	Unit	Initial Year	Finish Year	Notes	Reference	Data Availability
1	Building Type	Number of buildings	2021	2024	a) Residential b) Government Non-Residential	BGH Team	Available from SIMBG https://simbg.pu.go.id/

					c) Commercial Non-Residential		
2	Construction Rate	%	2021	2024	a) Residential b) Government Non-Residential c) Commercial Non-Residential	BGH Team	Available from Buku Informasi Statistik Infrastruktur PUPR Tahun 2022 (https://data.pu.go.id/buku-informasi-statistik-infrastruktur-pupr-tahun-2022-0)
3	Demolition Rate	%	2021	2024	a) Residential b) Government Non-Residential c) Commercial Non-Residential	BGH Team	Available from Buku Informasi Statistik Infrastruktur PUPR Tahun 2022 (https://data.pu.go.id/buku-informasi-statistik-infrastruktur-pupr-tahun-2022-0)
4	Annual specific energy use per m2	kWh/m ²	2021	2024	a) Residential b) Government Non-Residential c) Commercial Non-Residential	BGH Team	Available on Roadmap Bangunan Gedung Hijau (BGH) (https://ciptakarya.pu.go.id/admin/assets/upload/file/laporan/2024/10/09/62583_Peta%20Jalan%20Penyelenggaraan%20dan%20Pembinaan%20Bangunan%20Gedung%20Hijau%20(BGH).pdf)

5	Energy carrier mix (natural gas or electricity)	%	2021	2024	a) Residential b) Government Non-Residential c) Commercial Non-Residential	BGH Team	Available from Ministry of Energy and Mineral Resources (MEMR) Indonesia (https://www.esdm.go.id/id/publikasi/statistik)
6	Average floor area	m ² /building	2021	2024	a) Residential b) Government Non-Residential c) Commercial Non-Residential	BGH Team	Conversion from m ² /personnel to m ² /building. Data source from SIMANTU (https://simantu.pu.go.id/epel/edok/16799_MD_PROG_PEMBIAYAN_2.pdf)
7	Emission Factor	gCO ₂ e/kWh	2021	2024	(natural gas or electricity)	IPCC or Ministry of Environmental	Available
8	Factor of Barrier Effects	%	2021	2024		Analysis	Available

The availability of data from these 8 data types is used in calculating baseline, ex ante, and ex-post GHG Emissions in Buildings in Indonesia referring to the ICAT Guideline and used against *Permen PUPR No. 21 Tahun 2021*. The majority of the data to be used will come from the BGH Roadmap, SIMBG, SIMANTU, and PUPR Information Book. Furthermore, it comes from the Ministry of Energy and Mineral Resources and the Ministry of Environment and Forestry, as well as various analyses needed.

3. Project implementation plan

Initial stakeholders consultations have been performed to develop the project implementation plan. Project team have also analysed the regulation of *Permen PUPR No. 21 Tahun 2021*. Based on the regulation, several parameters have been sorted for assessing green building criteria that can meet the principle of efficient use of building energy. The selected energy efficiency assessment criteria have been adjusted to the GHG Assessment boundary in the ICAT Guideline, namely parameters that can cause significant emission impacts on green building policies originating from heating and cooling, use of hot water, lighting and appliances and electricity supply.

There were 71 assessment parameters obtained where each parameter has its own points. In this case, we group the assessment parameters into 3 (three) groups based on emission sources as mentioned above. Each assessment criterion has a point score, and buildings categorized as green buildings must have a total point score of 46 for energy efficiency. In determining these assessment parameters, we prioritize the assessment of two mandatory building categories, namely New Buildings and Existing Buildings with Mandatory Categories. Work assessment stages for new buildings starting from planning, construction to utilization, while for existing buildings only at the utilization stage. The parameters is detailed in [Annex 1](#).

Project team will continue to consult relevant stakeholders in data collection and perform calculation and analysis of the impact of building efficiency policy of *Permen PUPR No. 21 Tahun 2021* to GHG emissions.

Project team will also analyse the initiative from the Subroto Award for Energy Efficiency (PSBE) hosted by the Ministries of Energy and Mineral Resources. The initiative has been followed by more than 200 participants in 2023. The assessment criteria established in the initiative as well as data from representative participants will be analysed using ICAT Transformational Change Methodology.

Annex 1

Assessment Parameter of regulation *Permen PUPR No. 21 Tahun 2021*.

Ordo/ Building Category	Work Assessment Stage:	No	Performance Assessment Parameters:	Points	Emission source	GHG Impact (ICAT)
New Building (Mandatory)	Planning	A.1.a	A building with its longest wall facing the North-South direction, with a maximum tilt angle of 15° relative to the North-South axis.	1	Heating and Cooling	Reduced GHG emissions from reduced energy use
New Building (Mandatory)	Planning	A.1.b	A building with its longest wall oriented along the East-West axis, with a length exceedingly twice that of the North-South direction, and featuring engineered modifications to the building envelope (façade) and/or openings along the East-West axis.	2	Heating and Cooling	Reduced GHG emissions from reduced energy use
New Building (Mandatory)	Planning	A.2.a	Roofing and pavement materials with a solar reflectance (albedo) value of at least 0.3.	1	Heating and Cooling	Reduced GHG emissions from reduced energy use
New Building (Mandatory)	Planning	A.9.b	Engineering the integration of natural air and light into the building.	1	Heating and Cooling	Reduced GHG emissions from reduced energy use
New Building (Mandatory)	Planning	B.1.a	The building envelope has an accumulated Overall Thermal Transfer Value (OTTV) and Roof Thermal Transfer Value (RTTV) of a maximum of 35 Watt/m ² . Note: If the building is planned without an air	5	Heating and Cooling	Reduced GHG emissions from reduced energy use

Ordo/ Building Category	Work Assessment Stage:	No	Performance Assessment Parameters:	Points	Emission source	GHG Impact (ICAT)
			conditioning system, it will receive full value.			
New Building (Mandatory)	Planning	B.1.b	The ratio of transparent building envelope to solid building envelope, or the Window to Wall Ratio (WWR), should be less than 30%. Note: If the building is planned without an air conditioning system, it will receive full value.	4	Heating and Cooling	Reduced GHG emissions from reduced energy use
New Building (Mandatory)	Planning	B.2	Buildings with air-conditioned spaces but designed not to condition certain passive areas (such as corridors, lift lobbies, toilets, etc.) and are equipped with natural ventilation or mechanical ventilation so that thermal comfort is still met.	3	Heating and Cooling	Reduced GHG emissions from reduced energy use
New Building (Mandatory)	Planning	B.3.a	It is planned to use Air Conditioning (AC) with a room temperature of no lower than 25°C±1°C and a relative humidity of 60% ±10%. Note: If the building is planned without an air conditioning system, it will receive full points.	2	Heating and Cooling	Reduced GHG emissions from reduced energy use
New Building (Mandatory)	Planning	B.3.b	The kW/TR or COP of air conditioning equipment must comply with SNI 6390:2020 or the latest edition. Note: If the building is planned without an air	5	Heating and Cooling	Reduced GHG emissions from reduced energy use

Ordo/ Building Category	Work Assessment Stage:	No	Performance Assessment Parameters:	Points	Emission source	GHG Impact (ICAT)
			conditioning system, it will receive full points.			
New Building (Mandatory)	Planning	D.2.a	Each room, including those equipped with air conditioning systems, must be designed with a ventilation system and provided with a fresh air supply in accordance with the requirements of SNI 03-6572-2001 or the latest edition, considering CO ₂ and/or CO levels.	3	Heating and Cooling	Reduced GHG emissions from reduced energy use
New Building (Mandatory)	Planning	D.2.b	Every enclosed space in a building with high density and/or the potential for CO ₂ accumulation must be equipped with CO ₂ sensors with alarms and an automatic mechanical ventilation system to ensure that the comfort threshold for CO ₂ concentration (1000 ppm) is not exceeded.	3	Heating and Cooling	Reduced GHG emissions from reduced energy use
New Building (Mandatory)	Planning	D.3.a	Rooms are designed without using air conditioning units that use refrigerants.	5	Heating and Cooling	Reduced GHG emissions from reduced energy use
New Building (Mandatory)	Planning	D.3.b.1)	If a room must use an air conditioning unit, the unit should be selected with a refrigerant that has an Ozone Depletion Potential (ODP) of zero.	3	Heating and Cooling	Reduced GHG emissions from reduced energy use

Ordo/ Building Category	Work Assessment Stage:	No	Performance Assessment Parameters:	Points	Emission source	GHG Impact (ICAT)
New Building (Mandatory)	Planning	D.3.b.2)	Air conditioning units should use refrigerants with a Global Warming Potential (GWP) of no more than 700.	2	Heating and Cooling	Reduced GHG emissions from reduced energy use
New Building (Mandatory)	Construction	A.1.b.2.d)	Compliance of indoor air quality technical planning criteria with its construction implementation.	7	Heating and Cooling	Reduced GHG emissions from reduced energy use
New Building (Mandatory)	Construction	B.5.a.2)	Has energy management procedures from the planning stage, control and monitoring of planning to the evaluation of electricity consumption in the project. Note: Optimizing the use of Air Conditioning (AC) or replacing AC with natural ventilation where possible.	1	Heating and Cooling	Reduced GHG emissions from reduced energy use
New Building (Mandatory)	Operation	B.2.a.2)	Compliance with energy efficiency criteria according to construction implementation: Air Conditioning System: Compliance of air conditioning equipment efficiency with testing and commissioning results. If an air conditioning system is not used, full points are awarded.	9	Heating and Cooling	Reduced GHG emissions from reduced energy use
Existing Building (Mandatory)	Operation	A.3.d	Documentation of results and operational parameter data of equipment in	1	Heating and Cooling	Reduced GHG emissions from

Ordo/ Building Category	Work Assessment Stage:	No	Performance Assessment Parameters:	Points	Emission source	GHG Impact (ICAT)
			the form of logbooks (AC, elevators, generators, etc.) stored for at least the last 12 months (for periodic reporting).			reduced energy use
Existing Building (Mandatory)	Operation	B.4.a	Compliance with indoor air quality criteria in accordance with construction implementation. Compliance with indoor air quality parameters includes temperature, relative humidity, air speed, CO2 concentration, and PM2.5.	12	Heating and Cooling	Reduced GHG emissions from reduced energy use
Existing Building (Mandatory)	Operation	A.6.a.1).a)	The building envelope has an Overall Thermal Transfer Value (OTTV) and Roof Thermal Transfer Value (RTTV) of no more than 35 Watts/m ² .	5	Heating and Cooling	Reduced GHG emissions from reduced energy use
Existing Building (Mandatory)	Operation	A.6.a.1).b)	The ratio of the transparent building envelope to the solid building envelope (Window to Wall Ratio) is less than 30%.	3	Heating and Cooling	Reduced GHG emissions from reduced energy use
Existing Building (Mandatory)	Operation	A.6.a.2)	Buildings with rooms equipped with air conditioning systems but are planned not to condition some or all passive spaces (corridors, lift lobbies, toilets, etc.) and are equipped with natural or mechanical ventilation to maintain thermal comfort.	2	Heating and Cooling	Reduced GHG emissions from reduced energy use
Existing Building (Mandatory)	Operation	A.6.a.3).a)	Planned to use Air Conditioning (AC) with a minimum room	1	Heating and Cooling	Reduced GHG emissions

Ordo/ Building Category	Work Assessment Stage:	No	Performance Assessment Parameters:	Points	Emission source	GHG Impact (ICAT)
			temperature of 25°C±1°C and relative humidity of 60% ±10%.			from reduced energy use
Existing Building (Mandatory)	Operation	A.6.a.3).b)	The kW/TR or COP of air conditioning equipment must comply with SNI 6390:2020 or the latest edition.	4	Heating and Cooling	Reduced GHG emissions from reduced energy use
Existing Building (Mandatory)	Operation	A.6.c.2).a)	Rooms are designed not to use air conditioning units that use refrigerants.	4	Heating and Cooling	Reduced GHG emissions from reduced energy use
Existing Building (Mandatory)	Operation	A.6.c.2).b).(1)	If a room must use an air conditioning unit, the unit should be selected with a refrigerant that has an Ozone Depletion Potential (ODP) of zero.	2	Heating and Cooling	Reduced GHG emissions from reduced energy use
Existing Building (Mandatory)	Operation	A.6.c.2).b).(2)	Air conditioning units should use refrigerants with a Global Warming Potential (GWP) of no more than 700.	1	Heating and Cooling	Reduced GHG emissions from reduced energy use
Existing Building (Mandatory)	Operation	C.2.a.2)	Compliance with energy efficiency criteria according to construction implementation: Air Conditioning System: Compliance of air conditioning equipment efficiency with testing and commissioning results. If an air conditioning system is not used, full points are awarded.	4	Heating and Cooling	Reduced GHG emissions from reduced energy use
Existing Building (Mandatory)	Operation	C.4.a	Compliance of indoor air quality criteria with the implementation of	8	Heating and Cooling	Reduced GHG emissions

Ordo/ Building Category	Work Assessment Stage:	No	Performance Assessment Parameters:	Points	Emission source	GHG Impact (ICAT)
			renovation construction.			from reduced energy use
New Building (Mandatory)	Planning	A.9.b	Engineering to introduce natural air and light into the building.	1	Hot Water, Lighting and Appliance	Reduced GHG emissions from reduced energy use (due to increased use of energy efficient lighting and appliances)
New Building (Mandatory)	Planning	B.4.a.1)	The artificial lighting system in rooms is planned to have maximum power and lighting levels according to SNI 6197:2020 or the latest edition.	2	Hot Water, Lighting and Appliance	Reduced GHG emissions from reduced energy use (due to increased use of energy efficient lighting and appliances)
New Building (Mandatory)	Planning	B.4.a.2)	There is one switch for rooms smaller than 30 m ² .	2	Hot Water, Lighting and Appliance	Reduced GHG emissions from reduced energy use (due to increased use of energy efficient lighting and appliances)

Ordo/ Building Category	Work Assessment Stage:	No	Performance Assessment Parameters:	Points	Emission source	GHG Impact (ICAT)
New Building (Mandatory)	Planning	B.4.a.3)	Use of occupancy sensors/lighting controllers in rooms with specific functions as required by SNI 6197:2020 or the latest edition.	2	Hot Water, Lighting and Appliance	Reduced GHG emissions from reduced energy use (due to increased use of energy efficient lighting and appliances)
New Building (Mandatory)	Planning	B.4.b.1)	Areas that receive natural light according to standards have separate lamp grouping from areas that do not receive natural light.	4	Hot Water, Lighting and Appliance	Reduced GHG emissions from reduced energy use (due to increased use of energy efficient lighting and appliances)
New Building (Mandatory)	Planning	B.4.b.2)	Areas that receive natural light according to standards are equipped with light intensity (lux) sensors that can adjust the lighting according to the standard illumination level.	2	Hot Water, Lighting and Appliance	Reduced GHG emissions from reduced energy use (due to increased use of energy efficient lighting and appliances)
New Building (Mandatory)	Planning	B.5.b.4)	Use energy-saving lighting and AC systems for at least 30% of total usage during construction	3	Hot Water, Lighting and Appliance	Reduced GHG emissions from reduced

Ordo/ Building Category	Work Assessment Stage:	No	Performance Assessment Parameters:	Points	Emission source	GHG Impact (ICAT)
			activities. Note: Replacing conventional lights with LED lights.			energy use (due to increased use of energy efficient lighting and appliances)
New Building (Mandatory)	Planning	D.3.a	Have conducted and have a report on energy audits for equipment.	1	Hot Water, Lighting and Appliance	Reduced GHG emissions from reduced energy use (due to increased use of energy efficient lighting and appliances)
New Building (Mandatory)	Construction	D.3.b	Have regulations on energy conservation in the company (green policies).	1	Hot Water, Lighting and Appliance	Reduced GHG emissions from reduced energy use (due to increased use of energy efficient lighting and appliances)
New Building (Mandatory)	Operation	A.1.a.2)	Have documentation in the form of SOPs regarding energy-saving measures within the energy management system.	5	Hot Water, Lighting and Appliance	Reduced GHG emissions from reduced energy use (due to increased use of energy

Ordo/ Building Category	Work Assessment Stage:	No	Performance Assessment Parameters:	Points	Emission source	GHG Impact (ICAT)
						efficient lighting and appliances)
New Building (Mandatory)	Operation	A.3.d	Documentation of results and operational parameter data of equipment in the form of logbooks (AC, elevators, generators, etc.) stored for at least the last 12 months (for periodic reporting).	2	Hot Water, Lighting and Appliance	Reduced GHG emissions from reduced energy use (due to increased use of energy efficient lighting and appliances)
New Building (Mandatory)	Operation	B.2.a.1)	Compliance with energy efficiency criteria according to construction implementation: Ventilation System: Compliance with the minimum fresh air flow rate, particularly in high-density rooms (2.3 m ² /person).	1	Hot Water, Lighting and Appliance	Reduced GHG emissions from reduced energy use (due to increased use of energy efficient lighting and appliances)
New Building (Mandatory)	Operation	B.2.a.3)	Compliance with energy efficiency criteria according to construction implementation: Lighting System: Compliance with room illumination levels (lux).	3	Hot Water, Lighting and Appliance	Reduced GHG emissions from reduced energy use (due to increased use of energy efficient lighting and appliances)

Ordo/ Building Category	Work Assessment Stage:	No	Performance Assessment Parameters:	Points	Emission source	GHG Impact (ICAT)
New Building (Mandatory)	Operation	B.2.a.4)	Compliance with energy efficiency criteria according to construction implementation: Building Transportation System: Compliance with elevator waiting times during peak hours as per SNI 03-6573-2001. If no elevators are used, full points are awarded.	1	Hot Water, Lighting and Appliance	Reduced GHG emissions from reduced energy use (due to increased use of energy efficient lighting and appliances)
Existing Building (Mandatory)	Operation	A.6.a.4).a).(1)	The artificial lighting system in rooms is planned to have maximum power and illumination levels according to SNI 6197:2020 or the latest edition.	1	Hot Water, Lighting and Appliance	Reduced GHG emissions from reduced energy use (due to increased use of energy efficient lighting and appliances)
Existing Building (Mandatory)	Operation	A.6.a.4).a).(2)	There is one switch for rooms smaller than 30 m ² .	1	Hot Water, Lighting and Appliance	Reduced GHG emissions from reduced energy use (due to increased use of energy efficient lighting and appliances)
Existing Building (Mandatory)	Operation	A.6.a.4).a).(3)	Use of occupancy sensors/lighting controllers in rooms with specific functions	1	Hot Water, Lighting	Reduced GHG emissions from

Ordo/ Building Category	Work Assessment Stage:	No	Performance Assessment Parameters:	Points	Emission source	GHG Impact (ICAT)
			as required by SNI 6197:2020 or the latest edition.		and Appliance	reduced energy use (due to increased use of energy efficient lighting and appliances)
Existing Building (Mandatory)	Operation	A.6.a.4).b).(1)	Areas that receive natural light according to standards have separate lamp grouping from areas that do not receive natural light.	3	Hot Water, Lighting and Appliance	Reduced GHG emissions from reduced energy use (due to increased use of energy efficient lighting and appliances)
Existing Building (Mandatory)	Operation	A.6.a.4).b).(2)	Areas that receive natural light according to standards are equipped with light intensity (lux) sensors that can adjust the lighting according to the standard illumination level.	1	Hot Water, Lighting and Appliance	Reduced GHG emissions from reduced energy use (due to increased use of energy efficient lighting and appliances)
Existing Building (Mandatory)	Operation	C.2.a.3)	Compliance with energy efficiency criteria according to construction implementation: Lighting System: Compliance with room illumination levels (lux).	2	Hot Water, Lighting and Appliance	Reduced GHG emissions from reduced energy use (due to increased use of

Ordo/ Building Category	Work Assessment Stage:	No	Performance Assessment Parameters:	Points	Emission source	GHG Impact (ICAT)
						energy efficient lighting and appliances)
Existing Building (Mandatory)	Operation	C.2.a.4)	Compliance with energy efficiency criteria according to construction implementation: Building Transportation System: Compliance with elevator waiting times during peak hours as per SNI 03-6573-2001. If no elevators are used, full points are awarded.	1	Hot Water, Lighting and Appliance	Reduced GHG emissions from reduced energy use (due to increased use of energy efficient lighting and appliances)
New Building (Mandatory)	Planning	B.6	There is a plan to reduce electricity consumption by calculating lower energy consumption compared to the baseline*). For every 2% reduction in energy consumption, 1 point is awarded, with a maximum of 5 points. *) The baseline is a reference value for energy efficiency calculated based on SNI and regulations on energy conservation. The referenced SNI includes: a. SNI 6197:2020 (Energy conservation in lighting systems); b. SNI 6389:2020 (Energy conservation of building envelopes); c. SNI 6390:2020	5	Electricity Supply	Reduced GHG emissions due to reduced electricity demand from the grid

Ordo/ Building Category	Work Assessment Stage:	No	Performance Assessment Parameters:	Points	Emission source	GHG Impact (ICAT)
			(Energy conservation of air conditioning systems in buildings); or the latest edition.			
New Building (Mandatory)	Planning	B.7.a	The building is planned to have grouped electrical loads, each equipped with a kWh meter, and an electricity submeter is available for main power sources greater than 100 kVa.	2	Electricity Supply	Reduced GHG emissions due to reduced electricity demand from the grid
New Building (Mandatory)	Planning	B.7.b	Buildings with centralized air conditioning systems must use a Building Management System (BMS) to control electricity consumption in the building.	3	Electricity Supply	Reduced GHG emissions due to reduced electricity demand from the grid
New Building (Mandatory)	Construction	A.1.b.2. b)	Compliance of energy efficiency technical planning criteria with construction implementation.	8	Electricity Supply	
New Building (Mandatory)	Construction	B.7.c	There is a plan to utilize renewable energy sources for electricity supply.	2	Electricity Supply	Reduced GHG emissions due to reduced electricity demand from the grid
New Building (Mandatory)	Construction	B.5.a.1)	A table of planned electricity usage for all equipment and tools, both in the project area and at the project office, is available.	3	Electricity Supply	Reduced GHG emissions due to reduced electricity demand from the grid

Ordo/ Building Category	Work Assessment Stage:	No	Performance Assessment Parameters:	Points	Emission source	GHG Impact (ICAT)
New Building (Mandatory)	Construction	B.5.b.1)	If using electricity from PLN, a kWh meter is installed on the main panel and distribution panels for construction activities.	2	Electricity Supply	
New Building (Mandatory)	Construction	B.5.b.2)	If using a generator as a power source, an operational feasibility test is included to ensure optimal equipment performance.	2	Electricity Supply	Reduced GHG emissions due to reduced electricity demand from the grid
New Building (Mandatory)	Construction	B.5.b.3)	Monitoring of electricity and carbon fuel usage is conducted periodically (monthly).	2	Electricity Supply	Reduced GHG emissions due to reduced electricity demand from the grid
New Building (Mandatory)	Operation	B.2.b	Monitor and record actual monthly energy consumption over the last 6 months, create trends in graph form, and evaluate any deviations (increases or decreases) in energy consumption from the previous month.	4	Electricity Supply	Reduced GHG emissions due to reduced electricity demand from the grid
New Building (Mandatory)	Operation	B.2.d	Maintain energy consumption such that there is no increase in actual energy consumption exceeding 10% of the reference energy consumption and/or planned energy consumption. The reference energy	2	Electricity Supply	Reduced GHG emissions due to reduced electricity demand from the grid

Ordo/ Building Category	Work Assessment Stage:	No	Performance Assessment Parameters:	Points	Emission source	GHG Impact (ICAT)
			consumption is the actual energy consumption over 6 months from the previous year.			
New Building (Mandatory)	Operation	B.2.d	If able to achieve a 10% reduction in energy consumption from the reference energy consumption and/or planned energy consumption, an additional 1 point is awarded.	1	Electricity Supply	Reduced GHG emissions due to reduced electricity demand from the grid
Existing Building (Mandatory)	Operation	A.6.a.6)	There is a plan to reduce electricity consumption by calculating lower energy consumption compared to the baseline*). For every 2% reduction in energy consumption, 1 point is awarded, with a maximum of 5 points. *) The baseline is a reference value for energy efficiency calculated based on SNI and regulations on energy conservation. The referenced SNI includes: a. SNI 6197:2020 (Energy conservation in lighting systems); b. SNI 6389:2020 (Energy conservation of building envelopes); c. SNI 6390:2020 (Energy conservation of air conditioning systems in buildings); or the latest edition.	5	Electricity Supply	Reduced GHG emissions due to reduced electricity demand from the grid

Ordo/ Building Category	Work Assessment Stage:	No	Performance Assessment Parameters:	Points	Emission source	GHG Impact (ICAT)
Existing Building (Mandatory)	Operation	A.6.a.7).a)	The building is planned to have grouped electrical loads, each equipped with a kWh meter, and an electricity submeter is available for main power sources greater than 100 kVa.	1	Electricity Supply	Reduced GHG emissions due to reduced electricity demand from the grid
Existing Building (Mandatory)	Operation	A.6.a.7).b)	Buildings with centralized air conditioning systems must use a Building Management System (BMS) to control electricity consumption in the building.	2	Electricity Supply	Reduced GHG emissions due to reduced electricity demand from the grid
Existing Building (Mandatory)	Operation	A.6.a.7).c)	There is a plan to utilize renewable energy sources for electricity supply.	1	Electricity Supply	Reduced GHG emissions due to reduced electricity demand from the grid
Existing Building (Mandatory)	Operation	C.2.a.1)	Compliance with energy efficiency criteria according to the implementation of renovation construction. Compliance with the minimum fresh air flow rate, particularly in high-density rooms (2.3 m ² /person).	1	Electricity Supply	Reduced GHG emissions due to reduced electricity demand from the grid
Existing Building (Mandatory)	Operation	C.2.b	Monitor and record actual monthly energy consumption over the last 6 months, create trends in graph form, and evaluate any deviations (increases or decreases) in	2	Electricity Supply	Reduced GHG emissions due to reduced electricity demand

Ordo/ Building Category	Work Assessment Stage:	No	Performance Assessment Parameters:	Points	Emission source	GHG Impact (ICAT)
			energy consumption from the previous month.			from the grid
Existing Building (Mandatory)	Operation	C.2.d	Maintain energy consumption such that there is no increase in actual energy consumption exceeding 10% of the reference energy consumption and/or planned energy consumption. The reference energy consumption is the actual energy consumption over 6 months from the previous year.	1	Electricity Supply	Reduced GHG emissions due to reduced electricity demand from the grid
Existing Building (Mandatory)	Operation	C.2.d	If able to achieve a 10% reduction in energy consumption from the reference energy consumption and/or planned energy consumption, an additional 1 point is awarded.	1	Electricity Supply	Reduced GHG emissions due to reduced electricity demand from the grid
Existing Building (Mandatory)	Operation	C.2.e	Re-commissioning: perform measurement and verification of the efficiency of main system equipment and make improvements to restore the efficiency of the main system equipment to its original state for at least the last 6 months for the first time or every 6 months thereafter.	3	Electricity Supply	Reduced GHG emissions due to reduced electricity demand from the grid