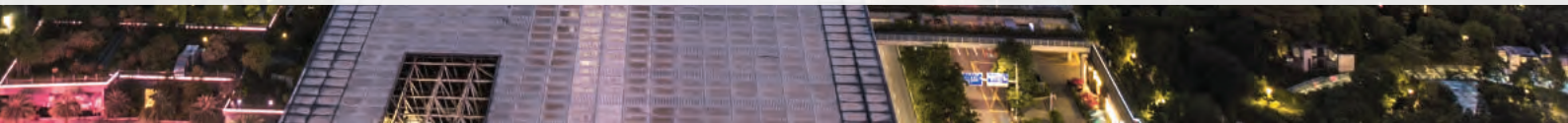


# APUEA

## Magazine

EFFICIENT  
URBAN  
ENERGY







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# Editorial

2020 has been a challenging year for many, to say the least. The global COVID-19 pandemic has forced us to change our daily routines, both in private and business. Working from home and attending meetings online have become normalities for many. Our social and economic activities have changed, resulting in an expected decline in energy demand (6%) and CO<sub>2</sub> emissions (8%) in 2020. At a glance, this is a positive trend, but it comes with a considerable impact on the global economy.

Accelerating sustainable energy investments can help boost economies and decouple energy demand and CO<sub>2</sub> reductions from negative economic development. However, this requires government support and can benefit from targeted stimulus plans, as renewable energy-based power generation investments are expected to decrease by 13% in 2020.

As a sector association, our responsibility is to continuously disseminate the values of sustainable urban energy developments, and, together with our members, support governments by sharing knowledge and offering solutions. The APUEA platform showcases the Urban Energy Best Practices through the APUEA Magazine, and events are hosted to support cities across the region. In recent years, APUEA has collaborated with organisations like ADB, UN ESCAP, C40, REN21, IRENA, and India Smart Grid Forum, which have contributed greatly to our events by bringing insights from their respective activities.

In the first quarter of 2020, we managed to host physical events before travel restrictions were put in place across the region. During the second and third quarters, APUEA mainly hosted online events, but ASEAN Sustainable Energy Week (ASE Week) took place 23–26 September in Bangkok as a hybrid event. ASE Week was a great success with 21 000 physical participants over the four days, with additional online participants in most seminars and workshops. APUEA hosted two seminars on “Sustainable Energy for Smart Cities” and “Sustainable Urban Energy”.

A hybrid event such as ASE Week is not possible without rigorous measures to mitigate COVID-19 risks. I want to highlight the extraordinary efforts of Informa Markets to ensure a safe event, including a tracking system, numerous health checkpoints, hygiene stations, social distancing by design, face masks, and additional voluntary face shields. Thanks to the measures implemented and the information campaigns prior to and during the event, we were able to enjoy interacting with business colleagues.

We are pleased to announce that APUEA has been selected to host the 7<sup>th</sup> Global District Energy Climate Awards (GDECA) in 2021. GDECA was launched in 2009, recognising outstanding innovative sustainable District Energy projects worldwide. The award is supervised by IEA and supported by Euroheat&Power, IDEA, and UN Environment. GDECA 2021 (#21GDECA) will be the main event during APUEA's Asia Urban Energy Assembly 11–12 November 2021 in Bangkok, Thailand.

In this issue of the APUEA Magazine, you can read articles about energy efficiency trends in Asia, the importance of planning, district heating and cooling contribution to climate change and a circular economy, experiences from Xian and Hohhot, among others. We would like to thank ABB, Chengfa, Engie, Fengxi New Energy, Johnson Controls, NXITY, Siveco, and Muhammad Ali for contributing to this issue of APUEA Magazine.



**Mikael Jakobsson**  
Executive Director,  
Asia Pacific Urban Energy Association (APUEA)



# Secretariat

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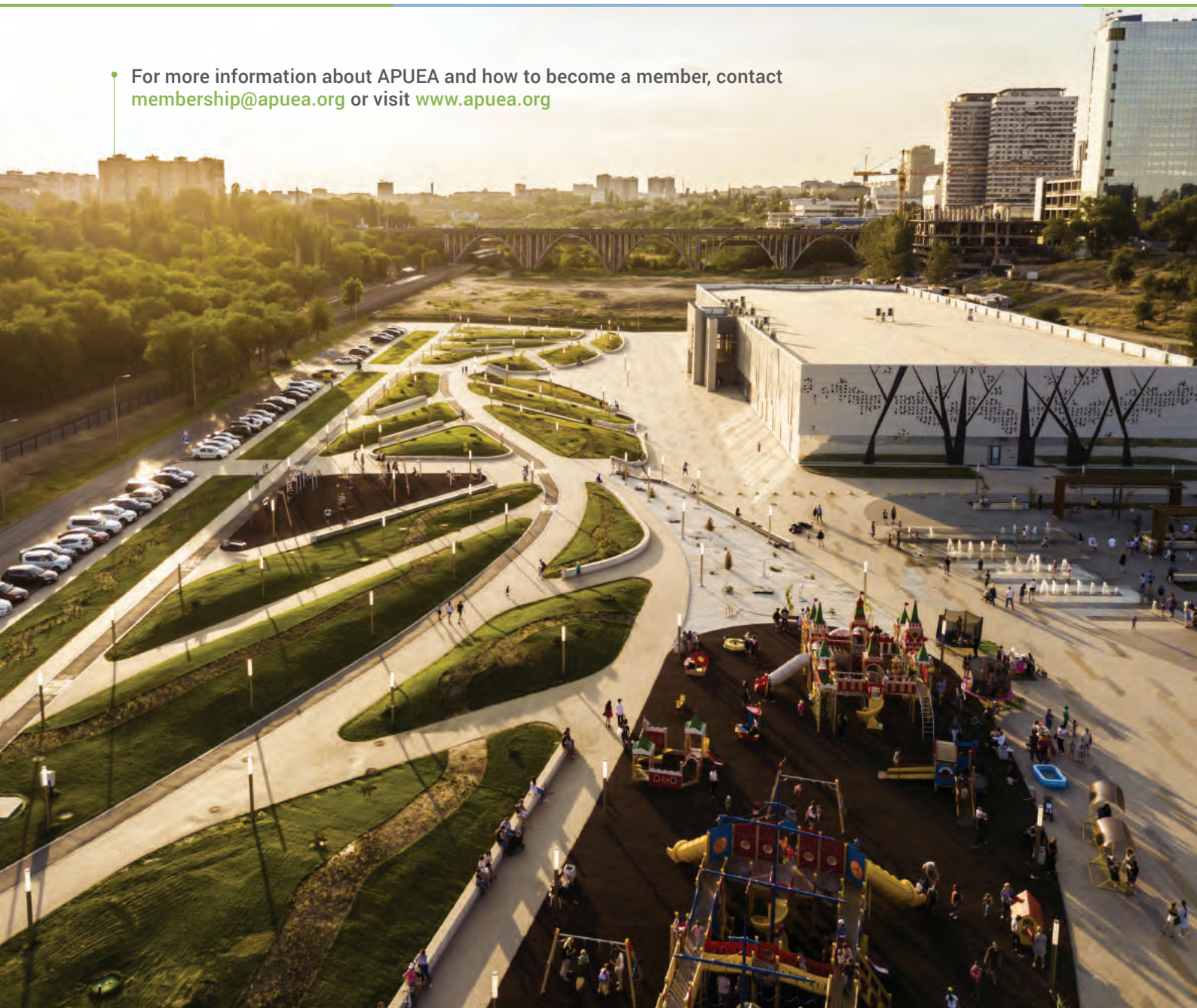


## Asia Pacific Urban Energy Association

The APUEA is an initiative of the International Institute for Energy Conservation (IIEC) that promotes the development of sustainable Urban Energy Systems in the Asia Pacific region. The APUEA platform promotes public and private sector collaboration to develop sustainable urban energy systems that support livable cities across the Asia Pacific region. The Association's online portal serves as an information hub to support city policymakers, program managers, and other stakeholders in the design, development, and implementation of sustainable urban energy systems. Through this portal, APUEA events, conferences, and continuous outreach to its members, the Association shares international and regional best practices for planning and implementing sustainable urban energy systems—including policies and regulations, business models, and technologies for implementing district heating and cooling, smart grids, energy efficiency improvements, and renewable energy systems.

An APUEA membership will provide a unique opportunity to liaise with governmental agencies and important stakeholders and get access to valuable information and intelligence on urban energy developments, business opportunities, trends, and financing in one of the fastest growing energy and infrastructure markets in the world. Membership benefits include a marketing platform, newsletters, APUEA Magazine, Annual Publications, Annual General Meeting including Trade Exhibition and Direct Assistance.

For more information about APUEA and how to become a member, contact [membership@apuea.org](mailto:membership@apuea.org) or visit [www.apuea.org](http://www.apuea.org)







# ASIA PACIFIC URBAN ENERGY ASSOCIATION MEMBERSHIP

The Asia Pacific Urban Energy Association (APUEA) is a platform to collect and disseminate knowledge, best practices, and tools related to the development of sustainable urban energy systems, and thereby support the development of livable cities in the Asia Pacific region.

APUEA serves a broad range of members including but not limited to utilities, manufacturers, investors, engineering companies, donor agencies and sector associations that are active in the urban energy sector. Members can choose among several membership categories, depending on their sector and level of engagement in APUEA.

APUEA Membership categories are:

## PREMIUM MEMBER

Premium membership includes an active role in the governance of the association through the APUEA Executive Committee and during the APUEA Annual General Meeting. Premium membership also includes special recognition in APUEA publications and marketing channels, and free participation at APUEA events.

## CORPORATE MEMBER

Corporate membership includes influence on the association's activities during the APUEA Annual General Meeting, recognition in APUEA publications and marketing channels, and discounted participation at APUEA events.

## AFFILIATE MEMBER (Invitation only)

Individual or agency invited by the Association to participate as an individual member; and entities such as regional NGOs, development agencies, and utility organisations. An Affiliate Member benefits from the Association but does not take an active role in the Association in terms of its governance and operation.



The annual membership fee depends on the membership category and organization size:

Member Category	Employees		
	≤ 1,000	1,000 - 10,000	≥ 10,000
Premium Member	USD 10,000	USD 10,000	USD 10,000
Corporate Member	USD 3,500	USD 5,000	USD 6,500
Affiliate Member	N/A		

## BENEFITS

- ✓ Advocacy and Representation
- ✓ Matchmaking and Referrals
- ✓ Direct Marketing
- ✓ Market Intelligence
- ✓ Knowledge and Best Practices
- ✓ Regional and International Events
- ✓ Direct Assistance





# Energy Efficiency Trends in Asia

By Heather DeLucia, Policy Analyst, Johnson Controls



**AS WE RECOVER FROM THE COVID-19 PANDEMIC, WE HAVE THE OPPORTUNITY TO BUILD BACK SMARTER AND BETTER. AS THE WORLD ENTERS A PERIOD OF ECONOMIC RECOVERY, INVESTMENT IN BUILDING INFRASTRUCTURE WILL BE IMPORTANT TO IMPROVE SAFETY AND RESILIENCE WHILE PROTECTING THE ENVIRONMENT.**

**Clay Nesler**

*Vice president of global sustainability and regulatory affairs, Johnson Controls*



Johnson Controls conducts an annual Energy Efficiency Indicator survey that tracks current and planned investments, key drivers, and organizational barriers to improving energy efficiency in facilities. Since the first survey was released in 2007, almost 27,000 energy and facility management leaders have been surveyed. This year marks the 13<sup>th</sup> edition of the survey with over 1,400 respondents represented from twelve countries, including 400 leaders from China, India, Japan, and Indonesia. The data for the survey was collected in December of 2019.

Globally, an increasing number of organizations are investing in energy efficiency, renewable energy, and smart building technologies. 62% of organizations reported they are increasing their investments over the next 12 months, which is 3% more than the prior year. In Asia, an average of 58% of organizations expect to increase investment. Organizations in China and Japan exceed both the regional and global average, with 74% and 75%, respectively, planning to increase investment.

In their investments, organizations are increasingly prioritizing resilience, a trend that predates the COVID-19 pandemic. In APAC, 77% of organizations said resilience is extremely or very important when considering future energy and building infrastructure investments, an increase of 8% since last year. Globally, 80% of respondents responded the same. Distributed energy resource (DER) technologies support facility resilience, and Japan in particular is prioritizing investment in electric energy storage, thermal energy storage, onsite renewable energy, and non-renewable distributed energy generation. On average, 9% more organizations in Japan invested in each listed DER technology compared to the average investment in APAC.



The focus on resilience and distributed energy is reflected in the rise of net zero energy or carbon buildings, as well as those that can operate off the grid. On average, 45% of organizations in APAC reported they are extremely or very likely to have one or more nearly zero, net zero, or positive energy or carbon facilities in the next ten years. Notably, 60% of respondents in China and 58% of respondents in Japan responded this way, exceeding the global average of 51%.

In comparison, 51% of APAC respondents say it is extremely or very likely their organization will have at least one facility able to operate off the grid in the next ten years. Globally, 54% of respondents say the same. China has the most respondents, 74%, expecting an off grid facility.

Overall, in APAC the most important driver in energy and technology investment was attracting and retaining employees, with an average of 70% of APAC respondents saying it was an extremely or very significant factor. This was followed by a tie for the second most important driver, with a regional average of 67% of organizations reporting energy cost savings and improving life safety and security were extremely or very significant factors.

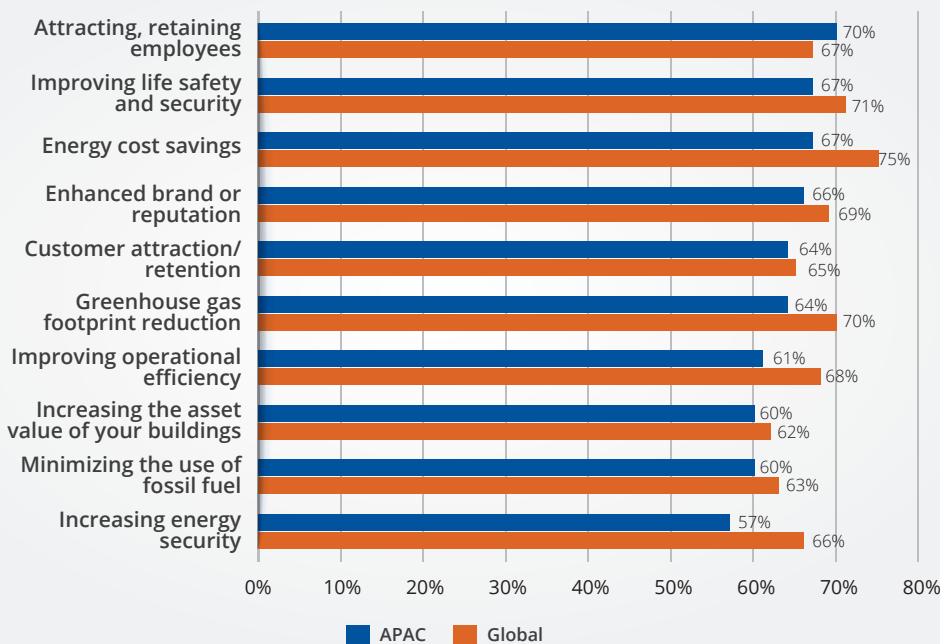
These drivers are very similar to the top three globally, with energy cost savings being the most significant factor (75% report it to be extremely or very significant), followed by improving life safety and security (71%), with greenhouse gas footprint reduction (70%) the third most significant driver. The chart below shows the top ten drivers regionally compared to the global responses.



Comparatively, the top investment barriers APAC respondents reported include lack of funding to pay for improvements (33%), lack of technical expertise to evaluate or execute projects (18%), and uncertainty regarding savings/performance (18%). Globally, the top three barriers reported are lack of funding to pay for improvements (30%), uncertainty regarding savings/ performance (22%), and insufficient payback/ROI (17%).

Though this survey was completed prior to the rise of COVID-19, we believe that efficiency investments worldwide will continue. When we conducted the survey in 2010, we found that 56% of organizations invested the same or more in the past 12 months (which included the depth of the Great Recession) as they had in previous years.

### Investment Drivers Globally and Regionally



During the 2009 recession, investments in efficiency were used to help the economy recover. Efficiency technologies could play an even larger part today in supporting both jobs and healthy buildings as countries look to support public health and the economy.

Efficiency investments often include co-benefits of improving indoor and outdoor air quality and increasing facility resilience. Facilities face increasing pressure to protect occupant health and safety while adjusting to rapidly changing conditions. For example, buildings may want to monitor indoor air quality metrics or more accurately control the amount of ventilation air supplied. Though some



COVID control strategies, such as increased ventilation and filtration, can increase energy use, these modifications can be balanced by efficiency improvements elsewhere in the facility.

For governments and policymakers interested in increasing investment in resiliency, efficiency, and occupant health and safety, the three most impactful policies include performance benchmarking and certifications, financial incentives and programs, and building energy codes and product energy performance standards. Respectively, 79%, 67%, and 64% of respondents stated that these policies were extremely or very important drivers of investment. Increased collaboration between governments, businesses and institutions can help successfully guide the APAC region through the coronavirus pandemic and economic recovery while improving facility safety, efficiency and resilience along the way.



Johnson Controls is a global diversified technology and multi-industrial leader serving a wide range of customers in more than 150 countries. It has more than 105,000 employees creating intelligent buildings, efficient energy solutions, integrated infrastructure and next generation transportation systems that work seamlessly together to deliver on the promise of smart cities and communities. Johnson Controls' commitment to sustainability dates back to its roots in 1885, with the invention of the first electric room thermostat. The company is committed to helping its customers win and to creating greater value for all of its stakeholders through a strategic focus on buildings and energy growth platforms.





# 7<sup>TH</sup> GLOBAL DISTRICT ENERGY CLIMATE AWARDS Asia Urban Energy Assembly

🕒 11 November 2021 📍 Bangkok, Thailand

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- ✓ 5 Award Winners
- ✓ 10-20 Exhibitors
- ✓ 200-500 Participants



GLOBAL DISTRICT ENERGY CLIMATE AWARDS



PARALLEL URBAN ENERGY WORKSHOPS



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APUEA ANNUAL GENERAL MEETING



SITE VISIT

## Urban Energy Disciplines

- ✓ District Cooling
- ✓ District Heating
- ✓ Thermal Energy Storage
- ✓ Multi-Energy Systems
- ✓ Industry Symbiosis

## Urban Energy Stakeholders

- ✓ Government Agencies
- ✓ Utilities
- ✓ Investors
- ✓ Solution Providers
- ✓ Academia





# Planning is the Key in Helping to Create More Efficient Systems for Cities

By ENGIE



**THE GOAL OF NET CARBON NEUTRALITY ENERGY GENERATION AND DISTRIBUTION CANNOT REALISTICALLY BE ACHIEVED OVERNIGHT BUT HAS TO BE PLANNED AS A LONG TERM STRATEGY.**



The world is moving more and more towards urban areas where almost 50% of the CO<sub>2</sub> emissions are being produced to meets citizens' needs in terms of transportation, energy and services. Key energy issues impacting city resilience such as access to energy, security of supply, a sustainable energy production mix and new levels of energy efficiency helping to reduce emissions, needs to be constantly addressed.

Climate change related to extreme weather conditions has the potential to disrupt operations resilience and can have long-term effects on the performance of infrastructure (capacity and efficiency).





Considering urban population growth and the impact of climate change on systems, whether extreme heat or cold, energy demand will drastically increase in the coming decades. Energy production and consumption must be properly evaluated and considered as a whole in order to define solutions that would meet the local needs.

*This can be achieved thanks to a very powerful tool known as the “energy master plan” which is based on the principle of complementary synergies of systems and circular economy.*

**What is at stake?:**

1. The Importance of strategic urban planning by the public sector and its policy as a “chef d’orchestre” involving all stakeholders of the territorial development including the private sector.
2. The importance of combining multi energy schemes from local renewable energy generation to grid connection as a systemic approach.
3. The integration of **District heating and cooling systems** as the backbone of a sustainable dense city to supply and optimize green energy on a large scale.

**The planned Roadmap to Carbon Neutrality**



Figure: Feasibility study of a district heating network

The goal of net Carbon neutrality energy generation and distribution cannot realistically be achieved overnight but has to be planned as a long term strategy with various short-term enhancements during the lifetime of the urban infrastructure and building schemes.

This initial planning process led by the public sector jointly with developers, builders, real estate owners and operators will definitely help to mitigate the risks of a project and define the best solutions that could meet the project objectives taking into account the local constraints and resources that could apply to a district heating or cooling system.

The importance of a long-term strategy becomes evident here to implement essential infrastructures that will allow the systems to adapt to the latest technologies and examples of this are **district heating and cooling systems**, private wire microgrids and Smart technology networks, all of which should be planned as a completely integrated and decentralised infrastructure.

Increasingly thermal or electrical storage is becoming an essential component of these decentralised networks to not only reduce the peaks of heating, cooling and power demand by exploiting low energy tariffs from utilities providers but also as a **sector integration** enabler which could capture waste heat from local industrial processes as well as renewable energy which cannot be consumed as it is generated.

The success of installing a Carbon neutral, low operating cost city-scale project will also have a direct impact on developing the local economy and tackling energy poverty, one of the blights of the modern world, and this parameter should be one of the main KPIs in the planning of any new urban infrastructure project.

**Power is nothing without control**

Even with the best designed systems and the latest technologies, if energy generation, distribution and consumption is not being properly measured and logged, then those systems will become increasingly inefficient with the consequence that reductions in CO<sub>2</sub> will be diluted.

Part of the planning of any urban utility network must therefore include a detailed execution plan for the centralised monitoring, recording and controlling of all essential parameters to record any values that exceed their thresholds and raise alarms to highlight any equipment failures.

This data should also be used by the intelligent central controllers, which are constantly learning and updating their algorithms (AI) to control the generation, storage and distribution of energy and achieve the optimum performance under different climatic and demand conditions.

**Completing the Circle**

Energy can no longer be considered in isolation and should be addressed along with **Water** and **Waste** management. As such, a true circular economy can only be achieved when the planning of the urban infrastructure coordinates and connects between energy, water and waste (solid and effluent).

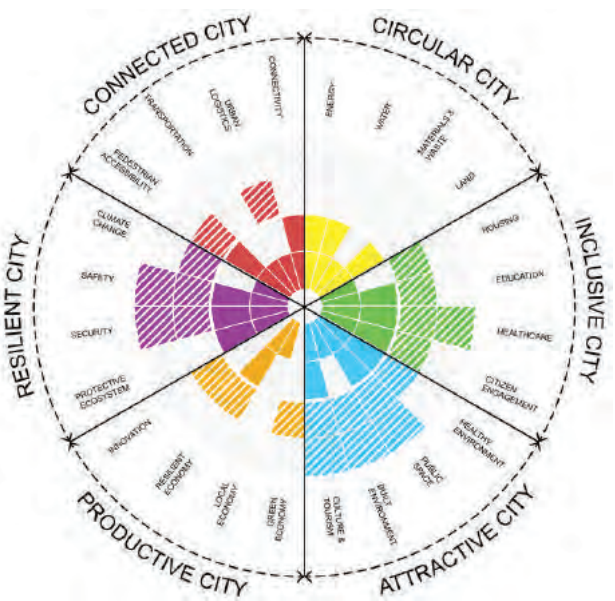
The district energy schemes (thermal or electric) allow us to connect energy from waste technologies such as incinerators and anaerobic digesters which drastically reduces the net output of waste and also provides low cost / Low Carbon power and clean water for recycling either on a campus, district or city scale.

**From global challenges to city perspectives**

**360° CITY SCAN** tool maps the performance of a city (infrastructure readiness and services efficiency) and thus potential growth areas from 6 different perspectives: circularity, inclusiveness, attractiveness, productiveness, resilience, and connectivity.

These aspects work together as a whole towards a balanced city and should be seen as different layers enclosing all the different aspects in the right ratio. When one aspect is underdeveloped, the city does not function properly and marginalizes citizens.

The aim is to introduce interventions in order to have a positive impact on all the aspects.



**District Heating and Cooling (DHC) solutions help to develop a more balanced city, making it more resilient, more inclusive and more circular.**

In the urban planning of tomorrow, digital is an essential lever to pre-model, to design and to operate. The expertise to simulate multiple energy scenarios taking into account energy needs (impacted by change drivers like energy efficiency actions, sector energy growth, population growth...) is key. Comparing these scenarios helps to establish a clear energy roadmap to meet the energy demand for the short, mid and long-term horizons considering:

- Energy efficiency actions by sector
- Mature and innovative solutions to reduce energy consumption: cogeneration, waste heat, geothermal, ...
- Solutions improving energy efficiency in transportation and using generating savings for cities
- Reduction of primary energy and water consumption as well as CO<sub>2</sub> emissions



"ENGIE Asia Pacific is a leading energy and services company focused on three core activities: low-carbon power generation, global networks and client solutions. With our regional headquarters in Singapore, we operate low-carbon power plants that focus on natural gas and renewable energy across Asia Pacific. Apart from our suite of renewable technologies including wind, solar, and hydro plants, our retail arm is based mainly in Singapore and Australia.

We are also growing our services business, largely in Singapore, Philippines, Malaysia and Australia. With the energy mix and fast-growing demand for power in Asia-Pacific providing significant opportunities for growth, we are striving towards our zero-carbon ambitions."



**Promoting Sustainable Urban Energy in Asia Pacific**

Asia Pacific Urban Energy Association (APUEA)





Combining Asia's leading energy events



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# Applying International Best District Heating Practices in Hohhot, Inner Mongolia Autonomous Region, P.R. China

James [Xin] Guan - Market Director NXITY, Fei Cao - Manager of Haoqingying Company of Hohhot City Chengfa Heating company, Liqin Wu - Deputy CEO, Hohhot City Chengfa Heating company, Yuezai Hu - Chief Engineer, Hohhot City Chengfa Heating company



**IT HAS BEEN A TRUE HONOUR FOR US AT NXITY TO WORK WITH CHENGFA ON THIS LANDMARK PROJECT. CHENGFA OPERATES ON A PROFESSIONAL LEVEL, AT LEAST, EQUAL TO INTERNATIONAL ENERGY UTILITIES, TAKING FULL ADVANTAGE OF OUR INTERNATIONAL EXPERIENCE.**



*- Li Shaofang, CTO NXITY*

Hohhot is the capital of the Inner Mongolia Autonomous Region (IMAR), with a population of three million. Extreme winter temperatures can reach below -30 °C, so heating supply is a social matter and for the public good. The largest district heating utility, Hohhot City Chengfa Heating company (Chengfa), supplies heat to east part of the city, corresponding to 31 percent of the total heat supply. In 2016, Chengfa decided to transition its district heating systems from traditional heat-supply infrastructure to a modern integrated energy system.

## Expansion and Modernization

Chengfa's district heating systems have expanded from 2500 MW in 2016 to 2900 MW in 2019. New energy-efficient pre-insulated pipes have been applied for network expansion and replacement of pipelines, with secure welded joints. Modern prefabricated substations equipped with heat meters and automatic control have been installed for new and replacement of substations. The improvement of facility construction and equipment installation was accomplished by introducing international (and national) best practices in project management, construction management, and quality management.



## Conversion to Pool Operation

Chengfa's five-sectioned district heating systems merged into two pool-operated district heating systems to optimize production efficiency and share spare production capacities. The two new systems are separated by a railroad, a challenge that will be overcome at a later stage when the systems are merged into one single pool operating system. Converting to a pool-operated district heating system requires that all substations be equipped with control valves, as the pressure level in the system will change depending on how the heat supply is distributed among the production facilities.

## Heat Recovery

There are available heat sources outside Hohhot that Chengfa has evaluated for heat recovery: a coal-fired power plant located 35 km southeast of the district-heating-system border and a municipal solid waste (MSW) combined heat and power (CHP) plant located 5 km south of the border. To supply recovered heat from the coal-fired CHP plant, a 35 km DN1400 transmission pipeline and two booster pump stations were constructed. The transmission pipeline is equipped with an emergency sectioning system.

## Replacement of Boilers and Integration of Curtailed Wind Power

Old coal heat only boiler (HOB) has been converted or replaced by efficient gas boilers. Low-NOx emission technology is used for all new gas boilers. Half of China's wind power capacity (150 GW) is located in Inner Mongolia. Historically, curtailed wind power has been "available" periodically in Hohhot, which is an opportunity Chengfa has identified and investigated. Installing highly efficient electrical boilers is being considered, which will provide carbon-free heat to the citizens in periods with curtailed wind power available.

## State-of-the-art System Analysis

Chengfa has engaged the Swedish-originated company NXITY to provide design and operation optimization and project implementation support services. NXITY has performed recurring seamless thermal, hydraulic steady-state and hydraulic transient-state analyses on this project.

Although a large share of the district heating network was modernized in this project, there are still areas with ageing, fragile pipes. In these areas, Chengfa has decided to safely operate with a maximum pressure of 12 bar(g), as opposed to the usual 16 bar(g). Consequently, based on sophisticated system analysis, NXITY has prepared an operation strategy and operation manual for the personnel to ensure safe operation throughout the heating season.

The CHP power plant is located at an elevation 50 m above the city's elevation, which, without safety measures, results in pressure surges in the case of a pump trip in the newly established booster pump stations, potentially damaging pipes and equipment – or even a risk to the public. NXITY has tailored a control sequence and safety arrangements to avoid such pressure surges and thereby eliminate the risk for accidents.

The 35 km transmission pipeline is equipped with leak-detection technology and an emergency sectioning system to minimize the risk of devastating water leakages. The emergency sectioning system can close the pipeline and isolate a leakage safely in less than two minutes.

## Future Perspectives

With the present project, Chengfa has proven its capabilities to develop modern district heating systems and is gearing up for "District Heating 4.0" or "Smart District Heating". With a well-implemented system as a backbone, the next step will be to focus on digitalizing the district heating system and utilizing data for predictive operation optimization and technical asset management. The district heating system in Hohhot, including this project, is a showcase on how to develop sustainable district heating systems in Asia and beyond.



NXITY, with its origin in Scandinavia, provides project development and optimization services for cities, utilities, investors and solution providers within District Energy, Thermal Power and Sustainable City developments.  
Contact: [guan.xin@nxity.com](mailto:guan.xin@nxity.com)



Hohhot City Chengfa Heating company is the leading district heating company in Hohhot with a total heating area of 50 million m<sup>2</sup>. While operating in a professional manner with focus on systemic efficiency, social responsibility and public well-being is always a top priority.





# District Heating and Cooling Contribution in Climate Change and Circular Economy

By Muhammad Ali, Project Manager- District Heating and Cooling at ENGIE Services Australia and APUEA Australasia Advisor



**DISTRICT HEATING AND COOLING SYSTEMS ARE BECOMING A STRATEGIC COMPANION IN ACHIEVING HIGHER EFFICIENCY AND A TRANSITION TO NET-ZERO CARBON. THESE SYSTEMS CAN HELP THE ENVIRONMENT BY INCREASING ENERGY EFFICIENCY, INTEGRATING RENEWABLE ENERGY TECHNOLOGIES AND REDUCING ENVIRONMENTAL EMISSIONS (CO<sub>2</sub> EMISSIONS, OZONE-DEPLETING REFRIGERANTS AND AIR POLLUTION).**



Urban growth is driving land-use change in Australia and this trend is expected to continue and escalate. Current projections suggest that 74% of Australians will live in capital cities by 2061<sup>[1]</sup>. The huge suburban sprawls around CBD areas of major cities are a major contributor to increasing energy demands. The built environment accounts for nearly 25% of total emissions in Australia (Campey et al, 2017). 41% of all energy used in the residential sector is consumed by space air conditioning (DEWHA, 2008) and 39% in commercial building environments (DCCEE, 2013), making space air conditioning the single largest energy user, accounting for approximately 40% of all energy use in residential and commercial buildings. Adding domestic hot water usage to the equation increases the need for energy even further. Similar growth trends in urbanisation are putting tremendous pressure on infrastructure, air and water quality on cities around the world.

# 40%

energy consumed by space air conditioning in Australia

District Heating and Cooling (DHC) is a resource efficient technology and delivers great value by providing sustainable heating and cooling with comparatively less energy consumption and, in turn, creates significant positive environmental impacts by reducing CO<sub>2</sub> emissions and pollution. District Energy in Cities, a program by the United Nations Environment Programme (UNEP), has identified the following key benefits and objectives for 45 champion cities that the deployment of district energy can achieve:

References:

[1] ABS (Australian Bureau of Statistics) (2015a). Australian demographic statistics, Jun 2015, cat. no. 3101.0, ABS, Canberra.



- Greenhouse gas emission reductions
- Air pollution reductions
- Energy efficiency improvements
- Use of local and renewable resources
- Resilience and energy access
- Green economy

### CLIMATE CHALLENGE

The global average temperature has risen by 1.0 degree Celsius from pre-industrial levels and is expected to rise by 4 to 5 degrees Celsius by the end of this century if we continue with a "business as usual" approach. This scenario is likely to result in a widespread biodiversity loss and crop failures and poses the risk of flooding for 80% of the world's population. The Paris Agreement Under the United Nations Framework Convention on Climate Change (UNFCCC) sets out a framework to alleviate the effects of climate change by limiting global warming to well below 2 degrees Celsius above pre-industrial levels and pursuing efforts to limit it to 1.5 degrees Celsius.



Source: World Meteorological Organization

Australia is responsible for around 1.3% of global emissions. Australia's 2030 climate change target is to reduce emissions to 26-28% on 2005 levels by 2030. This target represents a 50-52% emission reduction per capita and 64-65% emission reduction in emission intensity of the economy between 2005 and 2030.<sup>[2]</sup> Given that Australia's population is expected to grow by 1.5% per annum until 2030, this highlights the required scale of a reduction in emissions.

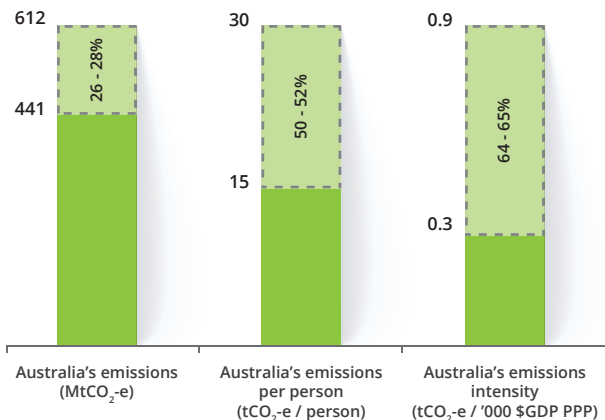
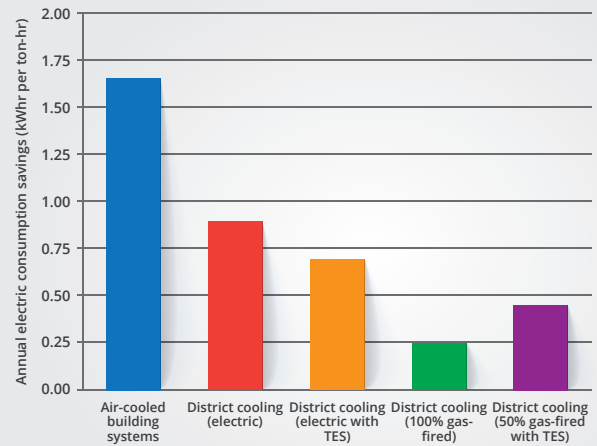


Figure 1 Australia's emission reduction targets and achievements, 2005-2030  
Source: Department of Environment analysis, Australian Government

Technology disruption, innovation breakthroughs, government incentives and falling prices of renewable technologies all play a vital role in reducing CO<sub>2</sub> emissions in Australia. District heating and cooling systems are becoming a strategic companion in achieving higher efficiency and a transition to

net-zero carbon. These systems can help the environment by increasing energy efficiency, integrating renewable energy technologies and reducing environmental emissions (CO<sub>2</sub> emissions, ozone-depleting refrigerants and air pollution).



Annual electric energy consumption saving with district cooling, Source: District Cooling Best Practice Guide, IDEA, [Regenerated]

In new developments, district cooling can reduce annual electricity consumption by 45% to 86% depending on the type of technology used. This reduction analysis compares the efficiency of several types of district cooling systems with air-cooled systems. The use of water-cooled chillers in district cooling systems produces substantial energy savings because the water-cooled system is more efficient than the air-cooled systems.

Cities like Paris are a pioneer in district cooling and realising the great potential of technology by 50% improvement in energy efficiency, 35% lower electricity consumption, 50% reduction in CO<sub>2</sub> emissions and 65% reduction in water consumption.

- 50%** higher energy efficiency
- 35%** lower electricity consumption
- 50%** reduction in CO<sub>2</sub> emission
- 65%** reduction in water consumption

District heating and cooling is becoming more widespread in Australia as technical, commercial and environmental benefits are being realised. With 40% of all of Australia's energy being consumed by space air conditioning, district heating and cooling can play a vital role in energy reduction and achieving 2030 emission reduction targets and a transition to net-zero carbon. To speed up the penetration of district heating and cooling systems, there is a need to support the development of a policy and investment roadmap and integration of this technology into national and local energy strategy and planning.

References:

[2] Australia's 2030 climate change target, Department of Industry, Science, Energy and Resources, Australian Government

## CIRCULAR ECONOMY

A linear economy traditionally follows the “take-make-dispose” model. This means that raw materials are used to make products that are used until the end of their useful life and are finally discarded as waste. In this economic system, value is created by collecting more raw materials and producing and selling as many products as possible.



Since material and natural resources are finite, it is imperative to move from a linear approach to more effective approaches to ensure there is enough raw material in future for food, heating and shelter. The circular economy is based on the principles of designing out waste and pollution, keep products and materials in use and regenerate material systems (Ellen MacArthur Foundation).

District heating and cooling contributes to the development of a circular economy for the HVACR industry by creating a closed loop system. Some opportunities presented by district heating and cooling include:

**Refrigerant Management:** Circular management of refrigerants is achieved by reclaiming and reusing. Using lower Global Warming Potential (GWP) refrigerants and reducing refrigerant charge by using more efficient refrigerants and advanced heat transfer technologies are a few examples.

**Energy Efficiency:** Excess heat recovery (waste heat in sewer water, district cooling returns and data centres), variable frequency drives and variable refrigerant temperatures produce leading efficiencies and achieve sustainability over the whole lifecycle of an installation.

**Cooling as a Service (CaaS):** CaaS is a new approach to cooling and is based on the concept of transforming a traditional product-focused model into a service-focused model. The concept of CaaS typically depends on the circular economy whole life cycle approach to:

- Asset management
- Maximising the value of the equipment, and
- Benefits provided by the asset throughout its operating lifetime, including at end-of-life (e.g. for re-use/re-sale, parts harvesting, etc.) [3]

By adopting CaaS, customers pay for the cooling service they receive. The payments are a fixed-cost-per-unit for cooling service provided to customers. It is in the interest of the service provider to ensure that their plant and equipment operate in an optimal way, resulting in even capital expenditure, lower operating costs and increased margins.

The implementation of CaaS in the district cooling industry is increasing gradually, bringing the circular economy component to cooling for a variety of end users connected to district cooling systems, such as residences, offices, commercial and institutional buildings. District heating and cooling service providers like ENGIE are offering Cooling as a Service (CaaS)



for new developments in Australia, which the benefits of which can be reaped by developers and end users.

**Waste to Energy (WtE):** According to a recent report [4], Australians are the twelfth-biggest producer of municipal waste among the OECD countries, producing nearly 600 kg per capita in 2018. Reducing this waste and avoiding landfill is a big challenge. Waste to Energy (WtE) or Energy for Waste (EfW) provides the opportunity for diverting non-recyclable waste from landfill to recover energy and provide electricity, heating and cooling back to society, completing the loop where waste heat acts as raw material for producing energy.

Waste sector consultant MRA Consulting Group estimate that energy from waste using feasible waste stream could generate baseload electricity equivalent to 2 per cent of Australia's electricity need [5]. WtE solutions are being adopted in various states in Australia, mainly for electricity generation. There are opportunities for Australia to exploit the synergies between WtE and district heating/cooling and providing sustainable heating/cooling to homes and industries.

## Conclusions

District Heating and Cooling (DHC) is becoming embedded in the master planning of new Cities and precincts as well as in the implementation of net-zero initiatives of existing developments in Australia. The acceleration of DHC is underpinned by several intertwined trends such as, the rise of urbanisation, increased commitments towards net-zero carbon transition, the adoption of “as a Service” servitization business model, and the development of environmentally friendly solutions through a/the circular economy.

DHC is a key technology in the transition to a sustainable society and has the potential to accelerate the progress in achieving climate change targets and net-zero initiatives through decarbonisation of heating and cooling networks in cities and industries by deploying low carbon heating and cooling solutions.

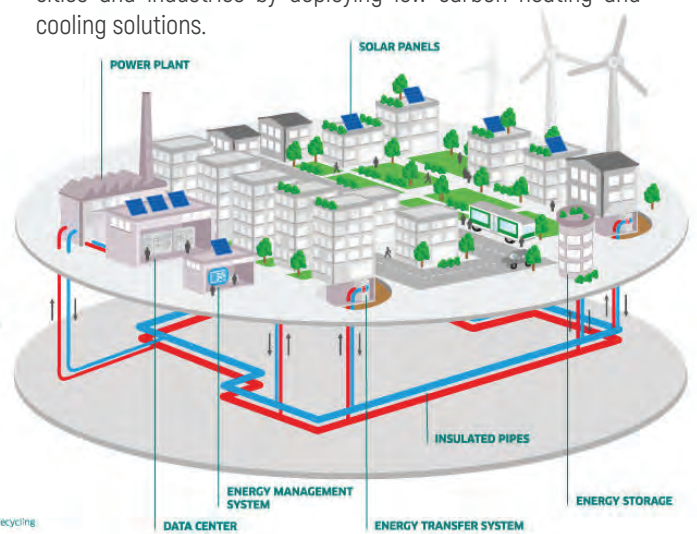


Image courtesy ENGIE

References:  
 [3] Kigali Cooling Efficiency Program brief on Cooling as a Service  
 [4] Environment at a Glance-Circular economy-waste and materials, OECD March 2020  
 [5] Energy from Waste in Australia; a state-by-state update by Clean Energy Finance Corporation

Abbreviations:  
 DEWHA, Department of the Environment, Heritage, Water and the Arts  
 DCCEE, Department of Climate Change and Energy Efficiency



# ASEAN SUSTAINABLE ENERGY WEEK



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# Exploration of the Innovative and Comprehensive Multi-Energy Services Provided by Fengxi New Energy

By LIU, Hongtao Ph.d, The president of Shaanxi Xixian New Area Fengxi New City Energy Development Co.ltd

“

**WE EMPLOY NEW DIGITAL TECHNOLOGY TO ENABLE ENERGY SYSTEMS TO MONITOR AND PROCESS MULTI-LAYERS OF INFORMATION AND PROVIDE EFFICIENT AND INTELLIGENT ENERGY SUPPLY AND VALUE-ADDED SERVICES TO OUR CUSTOMERS.**

”

With the rapid development of digital technology, new types of energy services are available in the current market. At Fengxi New Energy, we employ new digital technology to enable energy systems to monitor and process multi-layers of information and provide efficient and intelligent energy supply and value-added services to our customers. We call it a **“comprehensive multi-energy service”**.

Comprehensive multi-energy services provide two purposes. The first is a complete energy supply, covering a variety of integrated energy sources, including electricity, gas, cooling, and heating. The second purpose comprises engineering, investment, operation, and maintenance services. Integrated energy systems offer several advantages with complementary capabilities, such as high efficiency, operation flexibility, reduced emissions, and energy recovery.

The main business of Fengxi New Energy is the medium-deep geothermal clean energy system. The system collects low-grade heat via a closed loop from geothermal wells 2,000–3,000 metres deep. The low-grade heat is then upgraded by heat pumps to a sufficient temperature and is routed through heat exchangers in an underground distributed piping system, supplying energy to buildings and other customers. The first phase of this plan was completed in 2015 when two housing projects were connected to the heating system. One significant advantage of this system is that it does not consume





The comprehensive energy project of the innovative harbor of western China and the new campus of xian Jiao tong University



The comprehensive energy project for Xixian New District Central Hospital

fossil fuels and, therefore, does not directly generate carbon dioxide, sulfur dioxide, or other pollutants. During the annual four-month heating season, an estimated 16,000 tons of coal to burn and 43,000 tons of carbon dioxide emissions can be eliminated with this technology, for every one million square metres of indoor space. The system also reduces sulfur dioxide emissions by 136 tons, nitrogen oxide emissions by 250 tons, and dust emissions by 155 tons.

To further improve the efficiency in our clean energy systems, we are actively exploring the integration of new technologies, including solar photovoltaics, ice storage, and other energy storage. With these innovative capabilities, we can reliably provide clean and efficient energy services, including electricity, heating, cooling, domestic hot water, and steam, to our customers. We call this the Comprehensive Energy Utilization Mode 2.0.

Another example of our energy projects is the Science and Technology Innovation Harbor Comprehensive Energy Supply Station, which is situated on the edge of Wei river and supplies heat to the new campus of the Xi'an Jiaotong University. The total energy supply area is 1.59 million square metres, and it is the largest project in China that employs medium-deep geothermal energy and non-interference clean heating technology. Energy is distributed to customers through six energy transfer stations located in the area. The geothermal energy system is coupled with peak-load gas-fired boilers, which also provide hot tap water. A large dual-operating chiller and heat pump unit combines high-efficiency cooling and heating production in the energy station.

Another two comprehensive energy supply stations like this one have been implemented in Fengxi New City of Xi'an, largely eliminating coal heating and gas heating in the Fengxi area. The energy stations have played a vital role to fulfil the commitment of green development and increase the use of renewable energy for Fengxi New City.

The third stage of our energy concept is the Comprehensive Energy Utilization Mode 3.0. This concept, involving the Incremental Power Distribution Project, aims to unite power distribution businesses, break barriers in the power distribution industry, promote the integration of different energy sources, and enhance the flexibility of the energy

supply chain to fully realise a service package of electricity, heating, cooling, gas, and water. This approach is being applied in the Fengxi New City Silk Road Scientific & Technological Innovation Valley Business District. The first integrated electric vehicle service centre has been built and will be put into practice soon.

We will continue to explore innovative models of comprehensive energy utilization to fully take advantage of incremental power distribution and provide complete energy services. We will build modern district energy networks and incorporate the latest IoT (internet of things) solutions and energy management systems to maximise the efficiency and competitiveness of our services.



Fengxi New Energy is responsible for a comprehensive regional energy supply, including the planning, development, and construction of new energy systems using renewable energy, smart energy finance, and smart grids. The company actively promotes the ongoing energy revolution and is continuously creating models of energy utilization, which contribute to the establishment of the green and low-carbon industry in Fengxi New City.

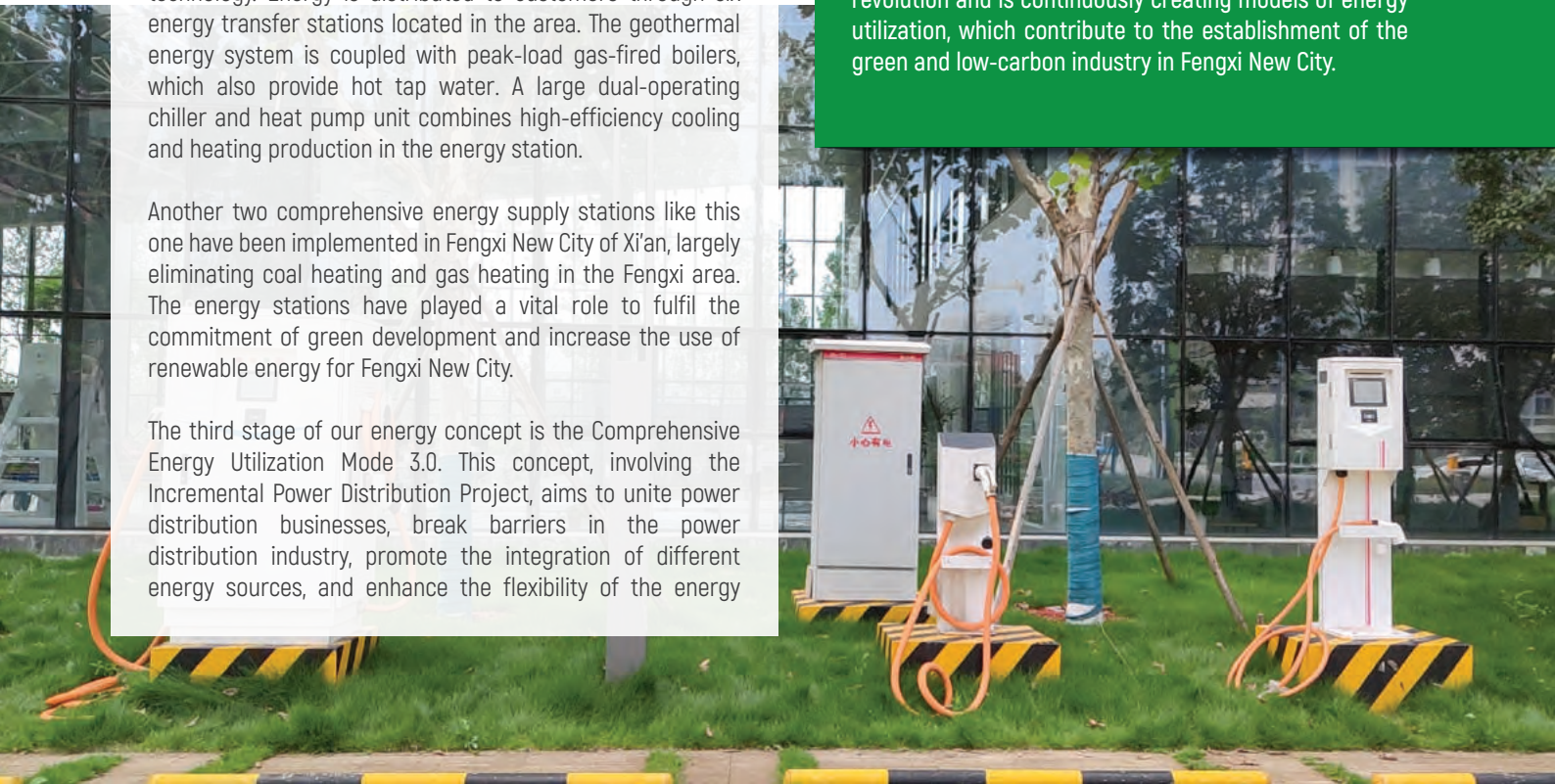




Photo Credit: Hanas New Energy

# Maximizing performance and efficiency by Smart Operation & Maintenance in the Asia Pacific

By Siveco

“

**IN THE PAST FEW YEARS, SIVECO'S UNIQUE BUSINESS MODEL, COMBINING INNOVATIVE TECHNOLOGIES AND O&M CONSULTING, HAS GROWN ALL OVER ASIA. THIS ARTICLE SHARES SOME OF THIS KNOWLEDGE IN THE FORM OF CASE STUDIES AND TESTIMONIALS OF PROJECTS IN ASIA.**

”

In the face of increasing pressure for performance, efficiency, safety and regulatory compliance, every owner-operator is launching its digital transformation initiative. Still traditionally managed by corporate IT departments accustomed to gigantic budgets and multiyear timeframes, these programs too often remain detached from the needs of Operation & Maintenance (O&M). Smart O&M pioneer Siveco has gained unparalleled experience from the mid-1980s in the French energy market and since the 2000s in China's massive infrastructure buildup. In the past few years, Siveco's unique business model, combining innovative technologies and O&M consulting, has grown all over Asia. This article shares some of this knowledge in the form of case studies and testimonials of projects in Asia.

## Providing Lifecycle support for Hanas New Energy LNG Plant

Hanas New Energy's core business is the provision of wind power, solar-thermal power and distributed energy. The group owns and operates the largest LNG Plant in China with a production capacity of nearly 1 million tons per year. LNG produced is stored in a 50,000 m<sup>3</sup> tank and exported by trucks from the terminal.





Modelling (BIM) for the design and construction phases. However, although the BIM included a large amount of building structural data, it lacked information relevant to operation and maintenance.

CNOOC selected Siveco and its “bluebee® cloud” platform with BIM integration: the system allows users to access all facility operation and maintenance data from the Revit 3D viewer embedded in a portal. The solution enables advanced work preparation, using data and graphics from the model to assess step-by-step work instructions and safety points. All related asset data including spares, contracts, documentation, etc. are available directly from the BIM model by clicking on relevant object.

Siveco maintenance specialists worked alongside Hanas New Energy’s engineering team to build the Computerized Maintenance Management System (CMMS) during the construction of the LNG plant, ensuring smooth transfer of technical documentation from construction to operation, supporting plant start-up (2012) with an accurate technical database and enforcing good maintenance practices from day one.

According to Plant Manager Dietrich Roeben: “The CMMS ensures most efficient work turnaround for all preventive and corrective maintenance, inspection, testing and plant modifications. The CMMS also plays a role in effective risk management, which is crucial to our operation, aiming at zero harm to people and environment, surpassing regulatory requirements.”

Years later, the Siveco team continues to support Hanas New Energy LNG Plant with regular training and coaching, as well as support. In 2016, the stock management module was put into use, followed in 2018, by the procurement module, taking the place of the corporate ERP system.

In the word of the Plant Manager: “In spite of inevitable personnel changes since the plant started, the CMMS and support from Siveco has remained strong, ensuring true lifecycle support and continuous improvement for our plant.”

### Ensuring CNOOC headquarter buildings’ asset integrity with BIM

**China National Offshore Oil Corporation (CNOOC)**, one of the three major oil companies in China, manages a growing real estate portfolio, for which it should ensure effective maintenance during the life of the facilities. For its new headquarters in Beijing, CNOOC had used Building Information



According to CNOOC’s IT Project Director Zhang Rui “Users access all facility data from the 3D viewer embedded in the system. For example, a technician can view all electrical connections, in order to prepare relevant work permits. This integrated platform makes up for the deficiency of the BIM in terms of operational data, meeting CNOOC’s demands for daily operation.”

Siveco’s BIM for O&M concept has since gained recognition worldwide and is used by large infrastructure owners such as Chongqing Water, Hongkong’s Drainage Service Department or French railway company SNCF.

### Steering Daramic Thailand towards World Class Maintenance

Daramic Thailand operates the largest and most advanced polyethylene separator manufacturing plant in Asia. In order to meet the company’s business objectives, Daramic Thailand initiated a World Class Maintenance project during 2015. Previous IT-driven initiatives had proven powerless.

In November 2015, two Siveco experts conducted a week-long maintenance assessment onsite. The assessment confirmed Daramic Thailand's improvement potential and defined a multiphase program based on the ISO 55000 Asset Management standard, with support from a cloud-based CMMS (based on Coswin 8i) and maintenance coaching services. Aimed at achieving significant financial gains with a 97% uptime target by 2018, the project was launched in March 2016, after approval of the company's top management in the US.

The plant database was ready within 3 months, a first success for the project, as establishing a consistent coding system was an insurmountable obstacle in previous CMMS initiatives. Preventive maintenance drastically increased within 6 months, resulting in a significant increase in plant uptime. Shutdown planning more particularly benefited, with all activities available and easy to export to Excel for the various parties.

According to Plant Manager JB Lestrade: "One year later, Daramic Thailand has achieved its first year uptime objective. Overtime has been reduced: for the first time, our work order backlog is under control. We have a much better visibility for further, continuous, improvement."

In this project, Coswin 8i's in-built translation tool was used to create Thai-language screens for end-users.

### Controlling industrial risks at Taiyo Nippon Sanso semiconductor gas plant

Japan's largest industrial gas producer Taiyo Nippon Sanso Corporation started production at its new electronics gas manufacturing plant (YTNS) in Yangzhou, China, in April 2019. YTNS operates high-precision equipment relying on professional maintenance, with a focus on anticipation through careful planning, under strict safety and regulatory oversight by the authorities, demanding full traceability of O&M actions and documented compliance. However, before startup, most resources were tied up with construction activities.

After several rounds of evaluation, YTNS selected Siveco to implement its innovative Smart O&M solution, with consulting services aimed at tackling the challenges identified. Siveco proposed a coordinated five-step methodology based on the ISO 55000 Asset Management standard. To each step corresponds activities in the deployment of the solution.

By enforcing systematic recording of failures, inspections and work done, the integrated mobile and cloud solution provides a technical knowledge base to support technical teams' daily work and to facilitate management decisions. The mobile tool has proven very user-friendly and efficient in supporting frontline teams in adhering to the strict regulatory framework effectively in an auditable way. The app runs on industrial Android phones certified for hazardous environments (Class I, Division 2). Essentially, bluebee® allows YTNS to "close the ISO 55000 feedback loop".



According to YTNS's Maintenance Manager Richard Yang: "After the 4 months implementation phase, the bluebee® system has been running smoothly since August 2019. It has become our main management platform and a tool for continuous improvement."

As the customer stories show, to succeed in digital transformation projects for O&M, Siveco advocates relying on the ISO55000 Asset Management standard as a practical framework, putting O&M managers in charge, and making use of modern, agile, technologies to tackle specific needs and foster continuous improvement. Far from competing with corporate IT programs, such Smart O&M initiatives coexist with them, adding tremendous value.



Siveco ([www.sivecoasia.com](http://www.sivecoasia.com)) is a pioneer in the development of Smart Technologies for Operation & Maintenance, with a focus on mobile solutions "for the worker of tomorrow." Siveco helps facilities owners, in particular, energy and environmental utilities, to optimize assets lifecycle and ensure regulatory compliance. Siveco has its Asian headquarter and R&D center in Shanghai. It is the only company in Asia to be ISO9001-certified for this scope of business.





# The Smart Technician in the Smart City

Siveco is a pioneer in the development of Smart Operation & Maintenance solutions for energy and environmental utilities, with a focus on mobility "for the worker of tomorrow". Headquartered in Hong Kong, Siveco Asia has since 2004 helped over 900 customers optimize the lifecycle of their assets and ensure regulatory compliance.



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# ABB Launches Innovative UPS Solution

By ABB



**AS LARGER DATA CENTERS PUSH POWER REQUIREMENTS EVER HIGHER, DEMAND FOR SCALABLE AND REDUNDANT POWER SOLUTIONS CONTINUES TO GROW. THE VAST AMOUNT OF ENERGY CONSUMED BY THESE DATA CENTERS MEANS THAT EVERY PERCENTAGE POINT IMPROVEMENT IN EFFICIENCY BRINGS WITH IT COST SAVINGS.**



ABB presents its new MegaFlex solution offering the most resilient and compact uninterruptible power supply (UPS) system on the market with a **reduced footprint of up to 45 percent.**

With enterprise demand driving more SaaS (Software as a Service) and IaaS (Infrastructure as a Service) applications, data center continuity has never been more critical.

As a market leader in UPS technology, the MegaFlex range from ABB is targeting the IEC and UL market, with power ranges of up to 1.5 and 1.6 MW respectively.

Presented to coincide with Data Centre World in London, the MegaFlex solution delivers excellent availability and reliability, with the most compact footprint on the market, up to 45 percent smaller for the IEC version compared to competitor models of equal power rating. Despite its small footprint, the UPS also delivers impressive sustainable power technology with reduced energy losses due to high efficiency converters of up to 97.4 percent, adaptable to variable IT load.

This supports ABB Electrification's Mission to Zero for smart cities, a vision for a zero-emission reality for all, and reinforces its commitment to offer safe, smart and sustainable power technologies to the global data center industry.





Ciaran Flanagan, Global Head of ABB's Data Center Business said: "As larger data centers push power requirements ever higher, demand for scalable and redundant power solutions continues to grow. The vast amount of energy consumed by these data centers means that every percentage point improvement in efficiency brings with it cost savings. More importantly it also supports our sustainability commitments.

"MegaFlex DPA has been created in response to increasing power demands and cleverly combines the highest efficiency ratings with the smallest footprint. We are excited to showcase this pioneering new product together with our broader portfolio of electrification and digital solutions for efficient and reliable data center operations."

Other key features of the MegaFlex UPS solution from ABB include:

- Standardized power distribution architectures in compliance with the Uptime Institute classification system and EN 50600
- High-efficiency converters in VFI (Voltage Frequency Independent) mode with up 97.4 percent efficiency, driving up cost savings and improving energy consumption
- Portability- server rack can be moved into position simply and safely with an onsite pallet truck
- Compatible with either lithium-ion or VRLA (valve-regulated lead-acid battery) for external storage
- Optional redundant power capacity of 1,000 kW N+1 and 1250 kW N+1
- The graphical system display allows the operator to display measurements, events and alarm
- Connectivity for optional communication boards including SNMP, Modbus TCP/IP, Modbus RS-485
- Provides up to 6 MW and satisfies the "six-nines" requirement for today's most demanding data centers.

MegaFlex DPA is designed to work in synergy with ABB's power infrastructure products to provide a continuous flow of clean power to a data center and deliver the system-wide resiliency needed for modern data storage solutions that implement distributed, cloud or hybrid approaches.

Serviceability is made easier and more accessible with its modular platform. Enhanced self-diagnostics improve speed to market, reduce downtime and importantly mitigate risk from human error during start-up and maintenance phases. An intelligent predictive maintenance program allows greater planning and reduces service schedules throughout the product life cycle.



Importantly, ABB has designed and delivered the MegaFlex DPA to deliver total peace of mind for customers with the assurance that their power is guaranteed by the very best power protection technology on the market.



**ABB (ABBN: SIX Swiss Ex) is a technology leader that is driving the digital transformation of industries. With a history of innovation spanning more than 130 years, ABB has four, customer-focused, globally leading businesses: Electrification, Industrial Automation, Motion, and Robotics & Discrete Automation, supported by the ABB Ability™ digital platform. ABB's Power Grids business will be divested to Hitachi in 2020. ABB operates in more than 100 countries with about 144,000 employees. [www.abb.com](http://www.abb.com)**

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# Recent APUEA Activities

By Asia Pacific Urban Energy Association (APUEA)



**APUEA WAS A CONFERENCE PARTNER OF THE 2020 EDITION OF ASEAN SUSTAINABLE ENERGY WEEK, AND WE ARE HAPPY TO ANNOUNCE THAT MORE THAN 21,000 PEOPLE VISITED THE EVENT OVER FOUR DAYS AT THE BANGKOK INTERNATIONAL TRADE & EXHIBITION CENTRE (BITEC).**



During the Covid-19 pandemic, we continue to support our members in developing sustainable urban energy by creating new meeting platforms, including hybrid meetings and webinars. Since, March 2020 APUEA has hosted hybrid and virtual events and webinars, including during the ASEAN Sustainable Energy Week, World Electric Vehicle Day, ASEAN Sustainable Energy Week (Webinar series #4), Asia Clean Energy Forum, and Smart Utilities in the Smart City (Member Webinar). During this period, the highlighted event was the ASEAN Sustainable Energy Week, held in Bangkok 23-26 September as a hybrid event. The event was held as a regular conference and exhibition and included virtual participation of both conferences and the exhibition. We are happy to announce that more than 21,000 people visited the event over four days at the Bangkok International Trade & Exhibition Centre (BITEC).

## ASEAN Sustainable Energy Week 2020 – Hybrid Event

**🕒 23 - 26 September 2020**

APUEA was a conference partner of the 2020 edition of ASEAN Sustainable Energy Week and co-hosted two sessions, the International Renewable Energy Asia Conference and the Sustainable Urban Energy Seminar during the event.



## International Renewable Energy Asia Conference: Sustainable Energy Solutions for Smart Cities

🕒 **23 September 2020**

On September 23, APUEA co-hosted a parallel session on the theme **"Smart Energy for Smart Cities"** together with the Joint Graduate School of Energy and Environment (JGSEE). The session included presentations and a panel discussion on solar energy, blockchain, and sustainable transportation. The session included speakers and panelists from JGSEE, APUEA, the International Renewable Energy Agency (IRENA), King Mongkut's University of Technology North Bangkok (KMUTNB), King Mongkut's Institute of Technology Ladkrabang and Impact Solar.



### Program

- 13.30 – 13.40 : Introduction by Chairman**  
– Dr. Athikom Bangviwat, JGSEE
- 13.40 – 14.00 : Potential of Solar Energy Contribution in Smart Cities (Online)**  
– Dr. Imen Gherboudj, International Renewable Energy Agency (IRENA)
- 14.00 – 14.20 : Blockchain: The Next Internet for Smart Cities**  
– Asst. Prof. Dr. Akara Prayote, King Mongkut's University of Technology North Bangkok (KMUTNB)
- 14.20 – 14.40 : Sustainable Transportation for Smart Cities**  
– Dr. Atit Tippichai, King Mongkut's Institute of Technology Ladkrabang
- 14.40 – 15.00 : Coffee Break**
- 15.00 – 15.20 : Path to Smart City**  
– Patrapol Tangchitnamthamrong, Impact Solar
- 15.20 – 16.20 : Panel Discussion: Smart Energy for Smart City**  
**Moderator: Peter Lundberg, APUEA**  
1) Asst. Prof. Dr. Akara Prayote, KMUTNB  
2) Patrapol Tangchitnamthamrong, Impact Solar  
3) Dr. Imen Gherboudj, IRENA  
4) Mikael Jakobsson, APUEA
- 16.20 – 16.30 : Wrap up and Closing**



## Sustainable Urban Energy Seminar

🕒 **24 September 2020**

On September 24, APUEA co-hosted a seminar on the topic **"Sustainable Urban Energy"** together with JGSEE and the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP). The session included presentations on district cooling, energy storage, renewable energy in cities, and smart operation and management. The session also included a city panel discussion on sustainable developments and a panel discussion on facilitating urban energy developments. The session included speakers and panelists from Johnson Controls, ENGIE, Lux Research, International Renewable Energy Agency (IRENA), Siveco China, The United Cities, and Local Governments Asia Pacific (UCLG ASPAC), Iskandar Regional Development Authority (Malaysia), Cauayan City (the Philippines), Asian Infrastructure Investment Bank (AIIB), Asian Development Bank (ADB), and Qatar Cool.



### Program

- Moderator: Peter Lundberg, Asia Pacific Urban Energy Association (APUEA)**
- 10.15 – 10.30 : Opening Remarks**  
– Dr. Athikom Bangviwat, Joint Graduate School of Energy and Environment (JGSEE)  
– Ksenia Petrichenko, Economic Affairs Officer at United Nations Economic and Social Commission in Asia and the Pacific (UNESCAP)  
– Mikael Jakobsson, Executive Director, Asia Pacific Urban Energy Association (APUEA)
- 10.30 – 10.45 : Trends and Technologies Empowering District Cooling Systems Energy Efficiency (Online)**  
– Garry Chui, Regional Manager, North Asia and Pacific, Johnson Controls
- 10.45 – 11.00 : District Cooling (Online)**  
– Anh-Hà Defoucaud, Head of District Cooling Schemes, ENGIE South East Asia
- 11.00 – 11.15 : Energy storage for urban energy resiliency (Online)**  
– Chloe Herrera, Research Associate, Lux Research
- 11.15 – 11.30 : Coffee Break**

- 11.30 – 11.45 : **Renewable Energy in Cities: Drivers of Action and Policy Tools (Online)**  
 - Michael Renner, Programme Officer, International Renewable Energy Agency (IRENA)
- 11.45 – 12.00 : **Smart Operation & Maintenance (Online)**  
 - Bruno Lhopiteau, Managing Director, Siveco China
- 12.00 – 12.20 : **Questions and Answers**
- 12.20 – 14.00 : **Networking Luncheon**
- 14.00 – 15.10 : **City Panel – Sustainable Developments (Online)**  
**Moderator: Ksenia Petrichenko, UN ESCAP**  
 1) Dr. Bernadia Irawati Tjandradewi - Secretary General, The United Cities and Local Governments Asia Pacific (UCLG ASPAC)  
 2) Puan Maimunah Jaffar – Director Technology & Innovation at Iskandar Regional Development Authority, Malaysia  
 3) Hon. Bernard Faustino M. Dy - City Mayor, Cauayan City, the Philippines  
 4) Ping Yean Cheah, Senior Strategy Officer, Asian Infrastructure Investment Bank (AIIB)
- 15.10 - 16.20 : **Panel: Facilitating Urban Energy Developments (Online)**  
**Moderator: Muhammad Ali, Asia Pacific Urban Energy Association / ENGIE**  
 - Teruhisa Oi, Principal Energy Specialist, Energy Division, South Asia Department, Asian Development Bank  
 - David Morgado, Senior Energy Specialist, Asian Infrastructure Investment Bank  
 - Anh-Hà Defoucauld, Head of District Cooling Schemes, ENGIE South East Asia  
 - Mohannad Khader, Commercial and Development Director, Qatar Cool
- 16.20 - 16.25 : **Workshop Conclusion**



# Webinar: World Electric Vehicle Day

**The role of Electric Vehicles in Asia Pacific Cities - Maximizing the benefits of integrated urban energy systems.**

🕒 **9 September 2020**

On September 9, in conjunction with World Electric Vehicle Day 2020, APUEA and ABB hosted a webinar to feature the latest electric-vehicle trends and insight on the topic: **“The role of Electric Vehicles in Asia Pacific Cities - Maximizing the benefits of integrated urban energy systems”**. The webinar includes speakers from APUEA, ABB, REN21, and C40 Cities.



## Program

- 13:00 – 13:10 : **Opening remarks**  
 - Mikael Jakobsson, APUEA  
 - Sami Raitakoski, ABB
- 13:10 – 13:25 : **Meeting the increasing electricity demand from Electric Vehicles**  
 - Peter Lundberg, APUEA
- 13:25 – 13:40 : **Future of EV-Technology**  
 - Kumail Rashid, ABB
- 13:40 – 13:55 : **Sustainable Mobility Developments in Cities**  
 - Anna Peiris, C40 Cities
- 13:55 – 14:10 : **Transforming Transportation: Linking Electric Vehicles and Renewable Energy**  
 - Lea Ranalder, REN21
- 14:10 – 14:25 : **Q&A**  
 - Audience
- 14:25 – 14:30 : **Webinar Conclusion**



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THE WEBINAR CAN BE RE-WATCHED HERE



# ASEAN Sustainable Energy Week – Webinar Series #4

## Integrated Energy Systems for Sustainable Cities – Empower Cities Post COVID-19

🕒 10 July 2020

On July 10, APUEA and Informa Market hosted the webinar “Integrated Energy Systems for Sustainable Cities – Empower Cities Post Covid-19”. The webinar, a part of a webinar series before the ASEAN Sustainable Energy Week, discussed how to seize the opportunity to empower cities and overcome challenges developing sustainable urban energy post- COVID-19. The webinar included topics on local urban energy markets, collaboration with cities, integrated multi-energy systems, district cooling, and district heating. The session included the following speakers:

- Ksenia Petrichenko, UN ESCAP
- Martin Petersen, ABB
- Anh-Hà de Foucauld, ENGIE South East Asia
- Pär Dalin, Devcco
- Garry Chui, Johnson Controls

# Virtual Asia Clean Energy Forum 2020








## Future Development of Sustainable Urban Energy in Asia Pacific – Maximizing the Benefits of Integrated Urban Energy Systems

🕒 16 June 2020

On June 16, in conjunction with the Virtual Asia Clean Energy Forum 2020 (ACEF 2020), APUEA and C40 Cities hosted the webinar “Future development of sustainable urban energy in Asia Pacific – Maximizing the benefits of integrated urban energy systems”. Building on the ACEF 2020 theme, “Vision 20/20: Cross-sectoral Innovations for a Sustainable Future”, this session explored what challenges cities are facing to develop sustainable urban energy schemes. The session discussed opportunities and challenges with integrated urban energy systems and the importance of cross-sectoral engagement to develop sustainable urban energy. The session also shared regional experiences and international best practices.



**Speakers**

 <b>Mikael Jakobsson</b> Executive Director, Asia Pacific Urban Energy Association (APUEA)	 <b>Jacqueline Lam</b> Deputy Regional Director, East, Southeast Asia and Oceania, C40 Cities	 <b>Constant Alarcon</b> Programme Manager, Clean Energy, C40 Cities	 <b>Teruhisa Oi (Teru)</b> Principal Energy Specialist, Energy Division, South Asia Department, Asian Development Bank
 <b>Pär Dalin</b> President, Devcco	 <b>Reji Kumar Pillai</b> President, India Smart Grid Forum	 <b>Rebecca Chan</b> Programme Manager, Climate Action Planning, Southeast Asia, C40 Cities	 <b>Arnaud Davyillier</b> Head of Aden Smart City, CEO, Adenergy

### Program

- 20:00 – 20:05 : **Opening remarks**
  - Mikael Jakobsson, APUEA
  - Jacqueline Lam, C40 Cities
- 20:05 – 20:15 : **Cities Strategies for Accelerating the Clean Energy Transition in a Post-pandemic World**
  - Constant Alarcon, C40 Cities
- 20:15 – 20:25 : **Sustainable Urban Energy**
  - Mikael Jakobsson, APUEA

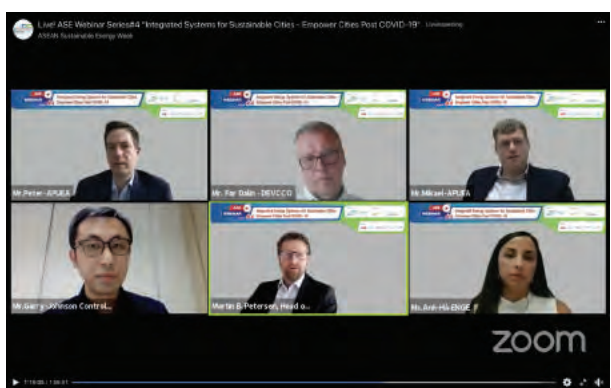
**ASEAN SUSTAINABLE ENERGY WEEK**  
**FREE ASE WEBINAR**  
Friday 10<sup>th</sup> July 2020 | 15:00 – 17:00 hrs. (GMT+7 Bangkok) | Conduct in English

**Integrated Energy Systems for Sustainable Cities - Empower Cities Post COVID-19**

**Registration Now!**

For more information, please contact:  
Ms. Ksenia Petrichenko  
k.petrichenko@unesco.org  
Tel: +852 319 4255 (Ext. 715)  
E: k.petrichenko@informa.com

Panel Speakers:  
Ksenia Petrichenko, UN ESCAP  
Martin Petersen, ABB  
Anh-Hà de Foucauld, ENGIE South East Asia  
Pär Dalin, Devcco  
Garry Chui, Johnson Controls



 THE WEBINAR CAN BE RE-WATCHED HERE

20:25 – 21:00 : **Panel, Maximizing the Benefits of Integrated Urban Energy Systems**

**Moderator: Mikael Jakobsson, APUEA**

- 1) Teruhisa Oi, Asian Development Bank
- 2) Arnaud Dauvillier, Adenergy
- 3) Pär Dalin, Devcco
- 4) Reji Kumar Pillai, India Smart Grid Forum
- 5) Rebecca Chan, C40 Cities

21:00 – 21:25 : **Q&A**

- Audience

21:25 – 21:30 : **Closing Remarks**



THE WEBINAR CAN BE RE-WATCHED HERE

## Webinar: Smart Utilities in the Smart City

### Supporting the Lifecycle of Energy Infrastructures with Smart O&M

🕒 **19 March 2020**

On March 19, APUEA and Siveco China hosted the webinar “Smart Utilities in the Smart City – Supporting the Lifecycle of Energy Infrastructures with Smart O&M”. The webinar was

directed towards utilities and industries in Thailand and included the following topics presented by Managing Director Bruno Lhopiteau and the Siveco China team!

- A case study of Chonburi Clean Energy
- Case studies of other energy and environmental utilities in Asia
- How to take Smart O&M into account from the design stage
- How to use ISO 55000 to drive IT projects
- How to achieve rapid, measurable, operational benefits

# Smart Utilities in the Smart City

**Mar 19**  
**14:00**  
**BKK time**

## Webinars

### Supporting the Lifecycle of Energy Infrastructures with Smart O&M

Duration: 45 minutes + Q&A, approximately 1h in total

This webinar aims to gather top managers from energy and environmental utilities in Thailand to share experience of using Smart O&M technologies to optimize infrastructure lifecycle and ensure regulatory compliance.

Topics covered include:

- A case study of Chonburi Clean Energy (waste-to-energy plant)
- Case studies of other energy and environmental utilities in Asia
- How to take Smart O&M into account from the design stage
- How to use the ISO 55000 to drive IT projects
- How to achieve rapid, measurable, operational benefits

How to register

For free registration please contact: [info@sivecochina.com](mailto:info@sivecochina.com)

About the speaker

Bruno Lhopiteau is the Managing Director of Siveco in Asia. He has worked in the region for over 25 years, primarily in the fast-developing Chinese market, but also in Southeast Asia, including Thailand.

Mr. Bruno Lhopiteau  
Managing Director of Siveco in Asia

APUEA contact

**Peter Lundberg, Head of Operations**  
[plundberg@apuea.org](mailto:plundberg@apuea.org)  
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 Mobile +86 13501935038

**Stanley Xu, Business Development Thailand**  
[stanley.xu@sivecochina.com](mailto:stanley.xu@sivecochina.com)  
 Mobile +86 15618985972

Follow-up activities for those interested

- ✓ Webinar #2: Live demonstration of Smart O&M solution implemented in a Thai WtE plant (CCE)
- ✓ Book a company-specific Q&A session with Siveco

For more on Siveco, [www.sivecochina.com](http://www.sivecochina.com)





# Event Calendar

## Focus Event

<b>11</b> <hr style="border: 0; border-top: 1px dashed white;"/> <b>NOV</b> <b>2021</b>	<p>🕒 11 - 12 November 2021</p> <p>📍 Bangkok, Thailand</p> <p><b>Asia Urban Energy Assembly / 7<sup>th</sup> Global District Energy Climate Awards</b></p> <p>APUEA Activity: Co-hosting Organization</p>
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## Workshops / Conferences

<b>17</b> <hr style="border: 0; border-top: 1px dashed white;"/> <b>NOV</b> <b>2020</b>	<p>🕒 17 November 2020</p> <p>📍 Hong Kong</p> <p><b>Asia Pacific Economical Cooperation (APEC) DHCS Workshop</b></p> <p>APUEA Activity: Supporting Organization</p>	<b>18</b> <hr style="border: 0; border-top: 1px dashed white;"/> <b>NOV</b> <b>2020</b>	<p>🕒 18 November 2020</p> <p>📍 Virtual Conference</p> <p><b>Future Energy Show Vietnam</b></p> <p>APUEA Activity: Supporting Organization</p>
<b>23</b> <hr style="border: 0; border-top: 1px dashed white;"/> <b>NOV</b> <b>2020</b>	<p>🕒 23 - 25 November 2020 – TBC</p> <p>📍 Ho Chi Minh, Vietnam</p> <p><b>Smart and Sustainable City Development</b></p> <p>APUEA Activity: Supporting Organization</p>	<b>8</b> <hr style="border: 0; border-top: 1px dashed white;"/> <b>DEC</b> <b>2020</b>	<p>🕒 8 December 2020</p> <p>📍 P.R. China (Hybrid Webinar)</p> <p><b>China District Cooling Webinar 1</b></p> <p>APUEA Activity: Co-hosting Organization</p>
<b>TBD</b> <hr style="border: 0; border-top: 1px dashed white;"/> <b>DEC</b> <b>2020</b>	<p>🕒 December 2020 – TBC</p> <p>📍 P.R. China (Hybrid Webinar)</p> <p><b>China District Cooling Webinar 2</b></p> <p>APUEA Activity: Co-hosting Organization</p>	<b>TBD</b> <hr style="border: 0; border-top: 1px dashed white;"/> <b>DEC</b> <b>2020</b>	<p>🕒 December 2020 – TBC</p> <p>📍 India (Hybrid Webinar)</p> <p><b>India District Cooling Webinar 1</b></p> <p>APUEA Activity: Co-hosting Organization</p>
<b>TBD</b> <hr style="border: 0; border-top: 1px dashed white;"/> <b>DEC</b> <b>2020</b>	<p>🕒 December 2020 – TBC</p> <p>📍 India (Hybrid Webinar)</p> <p><b>India District Cooling Webinar 2</b></p> <p>APUEA Activity: Co-hosting Organization</p>	<b>23</b> <hr style="border: 0; border-top: 1px dashed white;"/> <b>MAR</b> <b>2021</b>	<p>🕒 23 - 25 March 2021</p> <p>📍 Jakarta, Indonesia</p> <p><b>Enlit Asia 2020/2021</b></p> <p>APUEA Activity: Supporting Organization</p>
<b>4</b> <hr style="border: 0; border-top: 1px dashed white;"/> <b>MAY</b> <b>2021</b>	<p>🕒 4 - 5 May 2021</p> <p>📍 Vilnius, Lithuania</p> <p><b>Euroheat &amp; Power Congress</b></p> <p>APUEA Activity: Supporting Organization</p>	<b>12</b> <hr style="border: 0; border-top: 1px dashed white;"/> <b>MAY</b> <b>2021</b>	<p>🕒 12 - 14 May 2021</p> <p>📍 Bangkok, Thailand</p> <p><b>ASEAN Sustainable Energy Week</b></p> <p>APUEA Activity: Co-hosting Organization</p>







# Member Directory

## Founding Members



ABB



Engie



Johnson Controls

## Members



International District Energy Association (IDEA)



Euroheat & Power (EHP)



Alliance to Save Energy



Qatar Cool



China District Heating Association (CDHA)



Danish Board of District Heating (DBDH)



International Institute for Energy Conservation (IIEC)



Northeast Clean Energy Council (NECEC)



District Energy in Cities Initiative



DEVCCO



Thai ESCO Association



Overseas Environmental Cooperation Center (OECC)



SPX FLOW



Chongqing Renewable Energy Society



Lux Research



Adenergy



Qingdao Energy Group



NXITY



SIVECO China



IVL Swedish Environmental Research Institute



Fengxi New Energy

## Partners and Supporting Organizations

- Asian Development Bank (ADB)
- International Energy Agency (IEA)
- United Nations Environment
- Asian Infrastructure Investment Bank (AIIB)
- REN21



# APUEA Registration Form - Membership

We, the under-mentioned organisation / company, hereby apply to become a member of APUEA:

## 1 ORGANIZATION / COMPANY DETAILS:

Organization name .....  
 Marketing name and/or Abbreviation .....  
 Street .....  
 Postal code ..... City ..... Country .....  
 General Phone ..... General Fax .....  
 General E-mail ..... Web .....  
 Primary Contact: First name ..... Surname .....  
 Position ..... Direct Phone ..... E-mail .....

## 2 ORGANISATION CATEGORY (please check as appropriate below):

- Association / Federation
- Manufacturer / Equipment Supply
- NGO
- Utility / Operator
- Academic
- Media company - Press / Journalist / Advertisement
- Advisor - Financial / Legal / Banking
- Building Sector
- Consultancy - Engineering / Design / Technical
- Other

Specify: .....

## 3 BILLING INFORMATION (if different from above):

Billing Address: .....  
 .....  
 .....

## 4 MEMBERSHIP CATEGORY (please check as appropriate below):

Member Category	Employees		
	≤ 1,000	1,000 - 10,000	≥ 10,000
Premium Member	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Corporate Member	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Affiliate Member	<input type="radio"/>		

## 5 PAYMENT METHOD:

-  Bank Transfer
-  Credit Card
-  Paypal

Please indicate preferred payment method. Payment instructions will be provided following confirmation of membership.

*Please complete the form, and send a scanned version to [membership@apuea.org](mailto:membership@apuea.org)*

