

The background is a complex digital landscape. In the foreground, a globe of the Earth is shown, overlaid with a white network of lines and nodes, representing global connectivity. Behind the globe, there are vertical server racks with glowing lights, and various data visualizations, including charts and graphs, are scattered throughout the scene. The overall color palette is dominated by blues and greens, with white highlights from the network lines and server lights.

Thailand's Alternative Energy Development Plan shapes the future energy ecosystem and opens up new opportunities

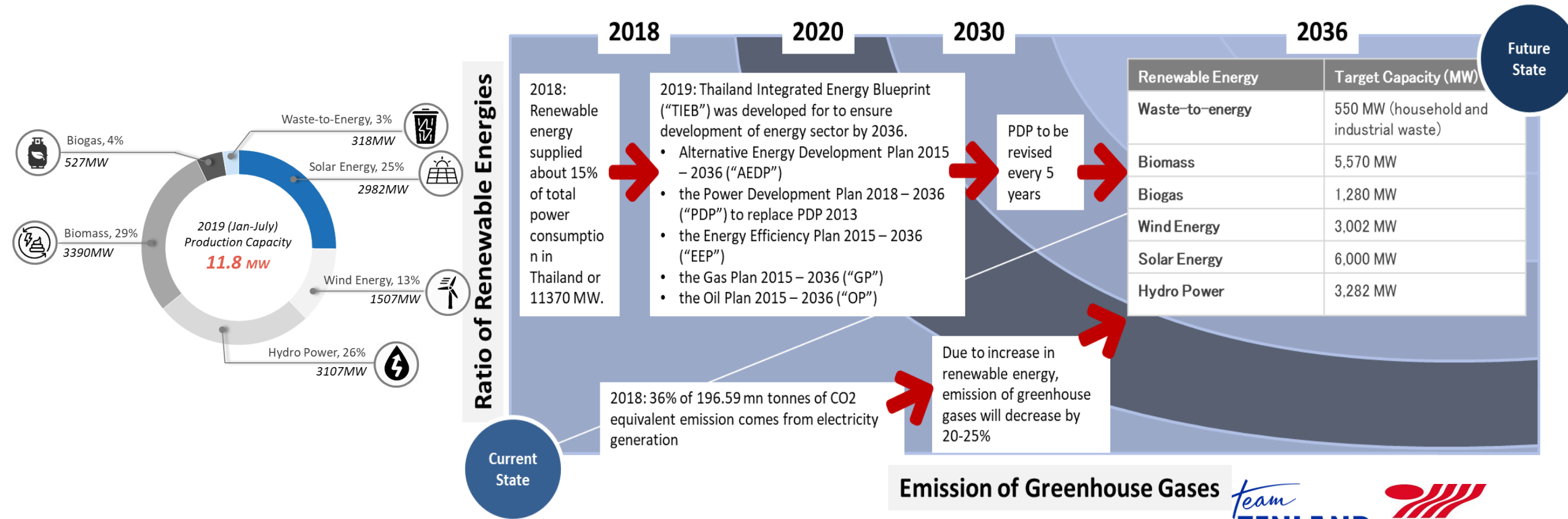
Summary

- Based on the recent Alternative Energy Development Plan by the Ministry of Energy, Thailand targets sourcing 30 per cent of its power from renewable sources by 2036.
- From 2019 to 2036, biogas energy is projected with the highest CAGR (compound annual growth rate) at 5.4%, followed by solar energy (4.2%) and wind energy (4.1%).
- Currently, the renewable energy market competition is fierce with Thai energy companies dominating the market.
- There are, however, opportunities aside from companies operating in the engineering, procurement and construction (EPC) business, and especially for those that are engaged in consulting, engineering services, and equipment manufacturing for solar and wind energy.
- In addition, future smart cities will give rise to many, localised smart grids which open up broader participation or partnership with foreign, smaller companies with smart grid capabilities and software companies with data gathering and advanced analytics.

Thailand's Alternative Energy Development Plan

To mitigate climate change, the Thai Energy Policy and Planning Office (EPPO) of the Ministry of Energy has produced the Alternative Energy Development Plan to source 30 per cent of all its power from renewable sources by 2036. Find more about the plan at: <http://weben.dede.go.th/webmax/content/10-year-alternative-energy-development-plan>

The current government efforts in renewable energy will shape Thailand's future energy ecosystem considerably. The below chart explains the transition and how the targets will be met.



Renewables play a significant role in Thailand's power energy mix



Renewables plays a significant role in Thailand's power energy mix

Thailand is the ASEAN leader in solar and wind power. To further reduce the use of fossil fuels, the government has adopted a strategy to support private investment in renewable energy by buying cleaner electricity generated by companies or people at a guaranteed price. Other policy measures include tax exemptions from imports of renewable energy equipment and attractive tax incentives to attract also foreign investors in renewables. In other words, private citizens can now sell excess energy to the grid.

From now on until 2036, Biogas energy is projected to have the highest CAGR (compound annual growth rate) at 5.4%, followed by solar energy (4.2%) and wind energy (4.1%). Solar power has received the highest number of on-going investments due to government liberalising the supply of power from rooftop solar cells, while renewables that are most competitive in terms of costs and sources of inputs are biomass, waste-to-energy and biogas.

The renewable market is already becoming very competitive by domestic operators. Thai energy companies like RATCH, Gunkul Engineering and EGCO are entering into the wind and solar energy market, while domestic sugar-producing companies such as Mitr Phol and tapioca starch firms generate biomass and biogas energy as their by-products. The aim is to turning municipal waste into power to local communities.

Within the competitive landscape, pockets of opportunities can be found for companies operating in engineering, procurement and construction (EPC) business, and/or are engaged in consulting, engineering services, or equipment manufacturing for solar and wind energy.

The future energy ecosystem is being shaped now.

Re-examining the energy ecosystem of the future



Re-examining the energy ecosystem of the future

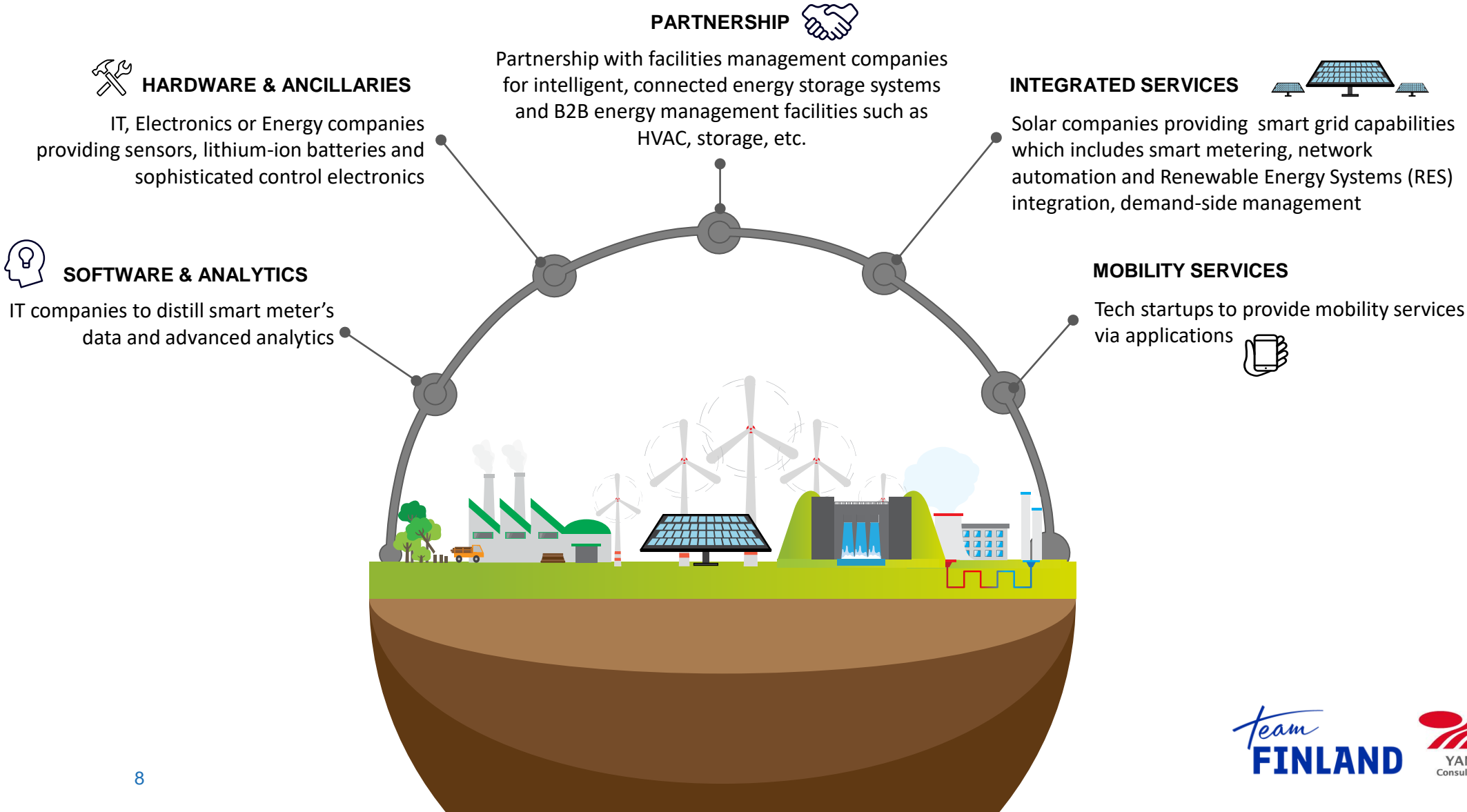
The Thai government is looking to develop all large urban areas to be smart cities by 2022. Twenty cities in nine provinces - Phuket, Chiang Mai, Khon Kaen, Bangkok, Chon Buri, Rayong, Chachoengsao, Yala and Nakhon Ratchasima - have submitted proposals for the government's smart city project.

Instead of a centralised, traditional coal or gas-powered utility structure, smart cities in Thailand aim at enabling a local, distributed microgrid for sustainable energy management. These smart grids would mainly be connected to wind or solar sources and allow smart cities to run off-grid for several days with less carbon emissions and higher energy efficiency. These smart grids also open up broader participation or partnership with foreign, smaller companies who can provide intelligent, connected energy storage systems and B2B energy management facilities such as HVAC and storage.

Smart grids or sustainable energy management requires a new suite of solutions to better match supply and demand. Tools like sensors, smart meter and analytics software can predict trends to show demand and supply curves based on customer's demand. Smart grids and energy storage systems will also require lithium-ion batteries and sophisticated control electronics, in turn creating opportunities for foreign players participating in smart grid infrastructure projects.

Thai energy companies will likely form partnerships with tech-sector companies as there is demand to be able to provide services in areas as 'pay as you go' mobile electricity, micro-grid investment accelerators and wifi-enabled solar kiosks.

Future opportunities



BUSINESS FINLAND FORESIGHT PARTNERED WITH YAMADA CONSULTING GROUP TO DISCUSS FUTURE OPPORTUNITIES RISING IN THAILAND, AND THIS MATERIAL WAS CREATED AS A RESULT.

Contact Information

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**BUSINESS
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Introduction to Yamada Consulting Group

We are one of the largest independent consulting firms in Japan with over 800 consultants. We have bases in major cities in Japan, and we are expanding globally, mainly in Asia. Our core business is management consulting on various sectors, and we support more than 1,000 projects annually.

Company Overview

Company	YAMADA Consulting Group Co., Ltd. (YCG)	
Founded	July 10 th , 1989	
Representative	President and Representative Director, Mr. Keisaku Masuda	
Head Office	10th floor (Reception on 9th floor) Marunouchi Trust Tower North, 1-8-1 Marunouchi, Chiyoda-ku, Tokyo 100-0005 Phone : +81-3-6212-2500 (Representative)	
Capital	1,599,530,000 yen	
URL	https://www.yamada-cg.co.jp/	
Listed on	1st Section of Tokyo Stock Exchange	
Securities code	4792	
Financial Term	March 31 st	
Consolidated Businesses	Management consulting Real estate consulting	Educational training / FP related business Investment and fund business
Head Count	897 (Including Spire and temporary employees. As of November 2019)	

YAMADA Consulting Group Co., Ltd.
(817 Employees)

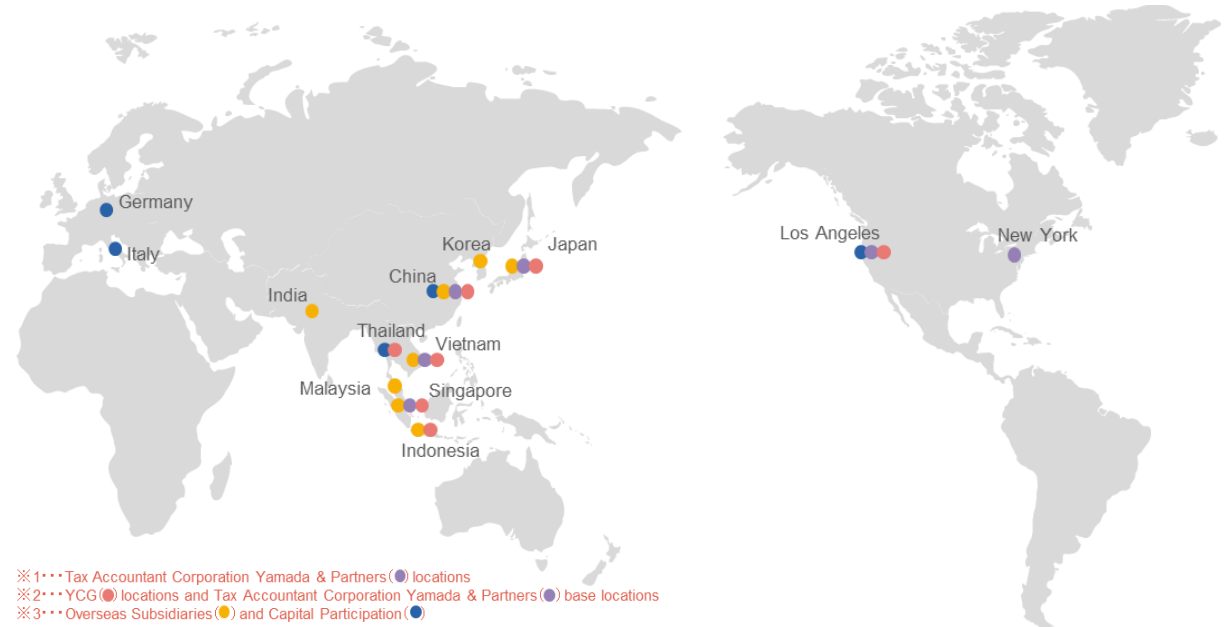


YAMADA Consulting Group

Spire Research & Consulting Pte Ltd.
(80 Employees)
Acquisition in 2016



spire
The Knowledge to Decide



※1 Tax Accountant Corporation Yamada & Partners (●) locations
 ※2 YCG (●) locations and Tax Accountant Corporation Yamada & Partners (●) base locations
 ※3 Overseas Subsidiaries (●) and Capital Participation (●)

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AMERICA OFFICE LOCATIONS	Los Angeles * 2 New York * 1			EUROPE OFFICE LOCATIONS	Germany * 3 Italy * 3	

