

PEA DIGITAL

ROADMAP

2018-2022

EXECUTIVE SUMMARY

PEA DIGITAL ROADMAP
(5 Years) 2018 - 2022

12 Feb 2018



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PEA Digital Roadmap 2018 - 2022

1. Introduction

Provincial Electricity Authority (PEA) currently has the 3rd Revision of Information and Communications Technology Master Plan (ICT Master Plan: 3rd Revision) to identify key ICT initiatives for PEA from 2013 to 2017 which is nearly ended. Moreover, according to PEA Strategic Plan 2014 – 2023 (4th Revision), PEA Strategic Positioning is defined to become “Digital Utility” by 2022.

To support PEA Strategic Positioning to become “Digital Utility” by 2022 and align with government policies and national energy policies, “PEA 4.0” Policy is developed to focus on “Developing People through Innovation, Improving Processes with Technology”. PEA also supports “Thailand 4.0” Policy to support the country’s economic and social sector and to transform public services to “Digital Government” according Digital Government Master Plan 2016-2018 by providing service excellence and strengthening grid operations with modern technology, security, and reliability to rapidly and efficiently serve electricity customers’ demands.

In order to achieve PEA’s Strategic Positioning to transform the organization to “Digital Utility”, PEA Digital Roadmap 2018 – 2022 therefore is developed to identify key strategic initiatives for the organization development in business and technological aspects to make an alignment across the organization to become “Digital Utility” which is the foundation of PEA to move forward as a National and Regional Leader of Utility in the future.

2. External and Internal Factors and SWOT Analysis

2.1. External Factors

According to external analysis, external factors which affect the organization’s business are in two folds including relevant plans and policies, and technology trends in utilities.

2.1.1. Relevant Plans and Policies

To ensure the alignment between PEA Digital Roadmap 2018 – 2022 and other relevant plans and policies as well as related strategies, the study of these relevant plans and policies

is conducted which can be categorized into three groups including National Plan, ICT/Digital Plan, and Energy Plan.

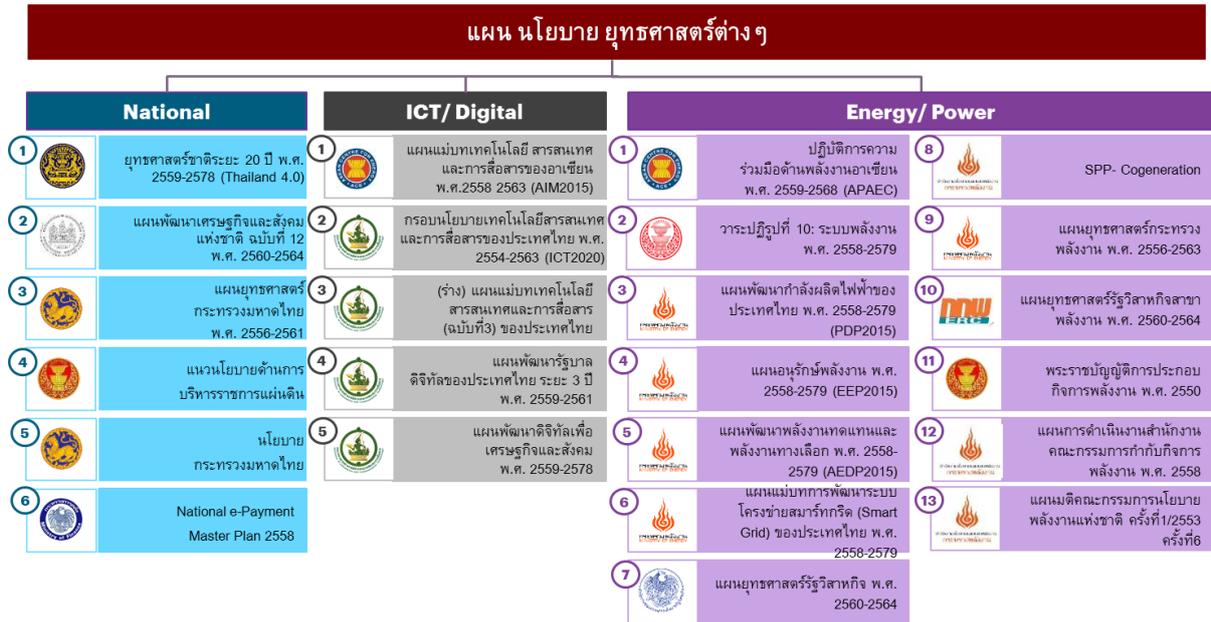
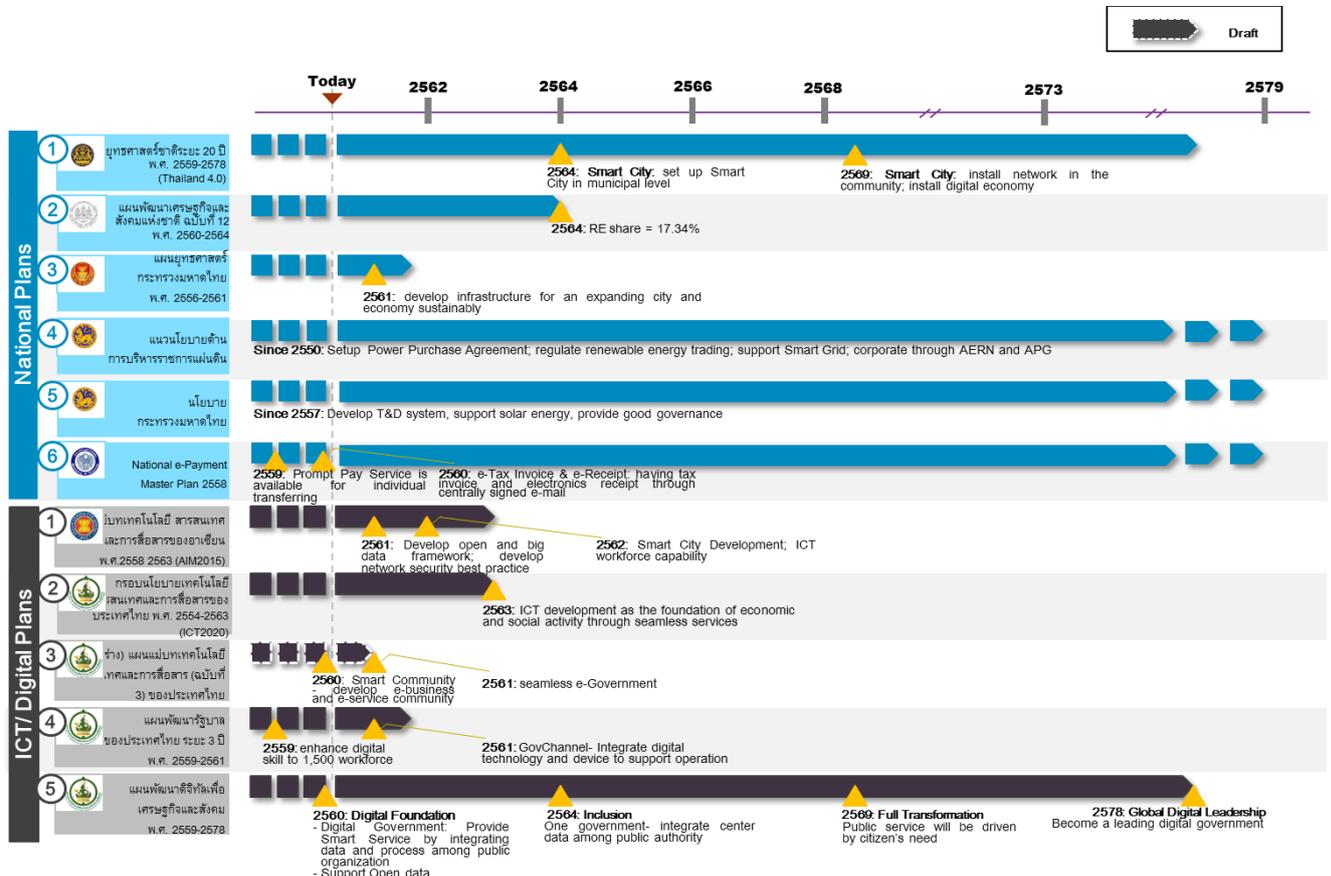


Figure 1: Relevant Plans and Policies

According to the study, key milestones of the relevant plans and policies can be summarized as shown in the two following figures.



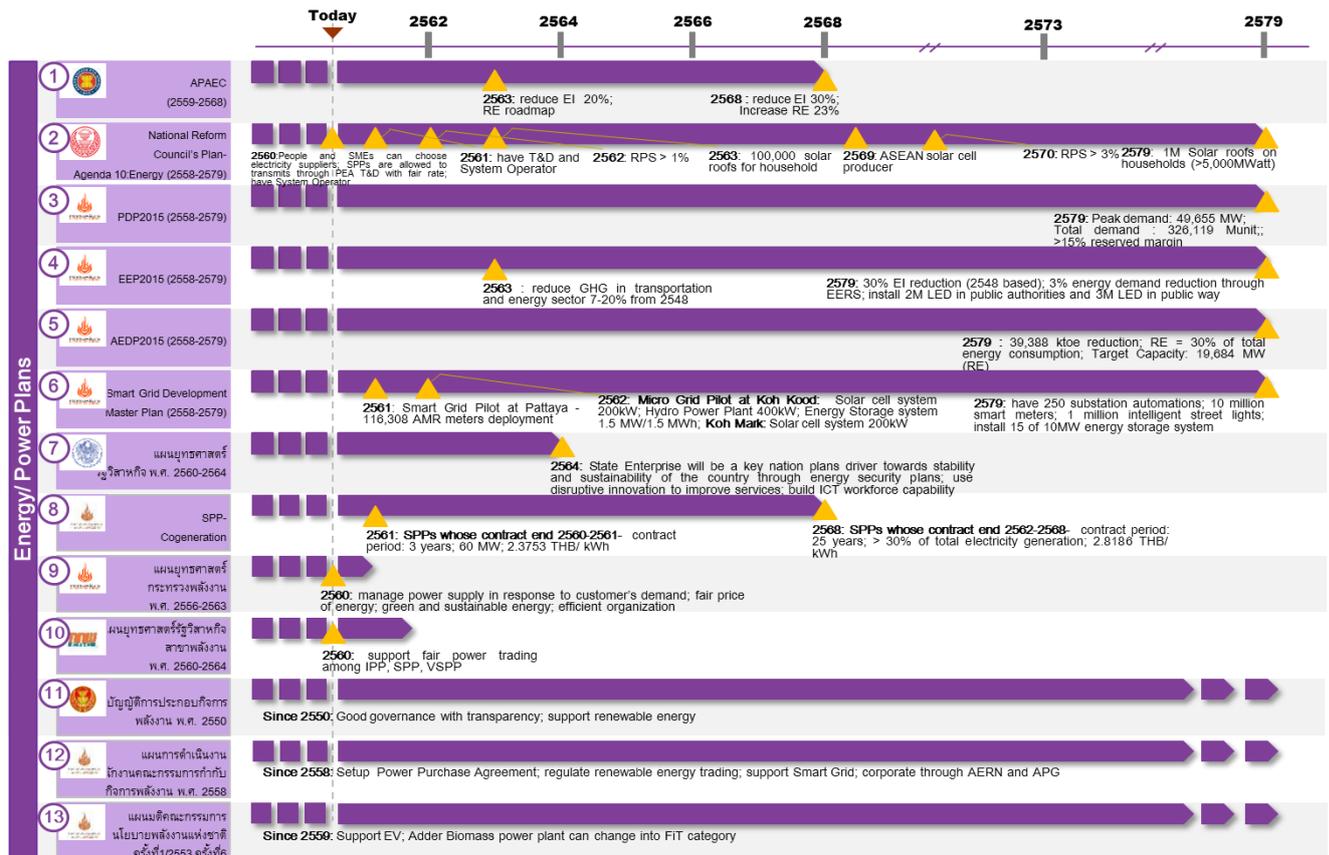


Figure 2: Key Milestones of Relevant Plans and Policies

2.1.2. Technology Trends in Utilities

Traditional utility organizations across global have been disrupted in terms of changing in the business ecosystem and the role of traditional utility organizations in the utilities marketplace since disruptive competition is now happening globally by having new players due to deregulations and shifting customer expectations in the digital era for the better products and services such as high electricity reliability and easy-to-use digital channels in customer services. Key technology trends can be summarized into “Twelve Game Changers” which are shaping our energy in the future as follows:

1. Distributed Energy
2. Renewable Transition
3. The Rise of Storage
4. Super & Micro Grids
5. Connected Everything
6. Cloud Services



7. The New MVPs
8. Artificial Intelligence
9. Hourglass Consumption
10. Me, Myself & AI
11. B2WE Societies
12. Peer to Peer Commerce

12 TRENDS THAT ARE SHAPING OUR ENERGY FUTURE

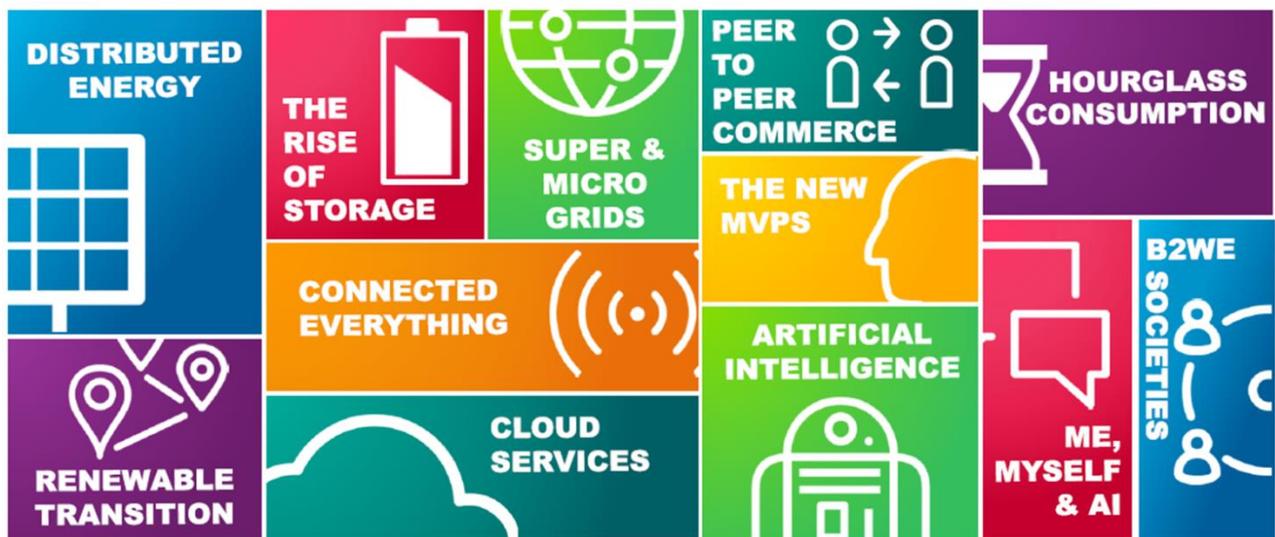


Figure 3: Twelve Game Changes Shaping Our Energy Future

2.2. Internal Factors

When it comes to an internal analysis, the purpose of this internal analysis is to ensure that PEA Digital Roadmap will support the organization’s business needs. The result of the internal analysis is as follows.

2.2.1. PEA Strategic Plan¹

PEA Strategic Plan 2014 – 2023 (4th Revision) identifies the organization’s business direction over the next ten years through the strategic positioning to become “Digital Utility” by 2022 with 5 Strategic Objectives (SO) and 11 strategies. In the first phase in 2018, leveraging the organization to archive operational excellence is the primary focus in the critical business areas including grid operations, customer services, good governance, and corporate social

¹ PEA Strategic Plan 2014 – 2023 (4th Revision)



responsibility (CSR). After archiving operational excellence, PEA aims to transform the organization to “Digital Utility” by 2022 and to move forward as a National and Regional Leader of Utility by 2027.

According to PEA Strategic Positioning to become “Digital Utility” by 2022, there are three digital transformation areas as follows:

1. **Digital Service** – to emphasize the development of digital technologies for improve the efficiency in customer services by developing a foundation of customer database and building customer analytics platform, plus enhancing digital channels to communicate with customers and provide digital customer services (This improvement area is to support SO3)
2. **Digital Operational Excellence** – to modernize grid network and system through Smart Grid technologies and to focus on interoperability-related technologies, plus to emphasize the use of digital technologies in an improvement of grid operations to efficiently and rapidly respond customer needs and customer expectations (This improvement area is to support SO2)
3. **Digital Business** – to apply digital technologies for improving the quality of products and services which lead to create new platform and business models in relevant industries in the future (This improvement area is to support SO 4)

PEA Digital Plan 2018 – 2022 aims to drive the organization in both business and digital technology aspects. In other words, the synchronization of all business operation functions across the organization and the development of digital technology platform are the foundation to drive PEA to achieve the strategic objectives.



PEA STRATEGIC PLAN 2014-2023

(พ.ศ. 2557-2566)

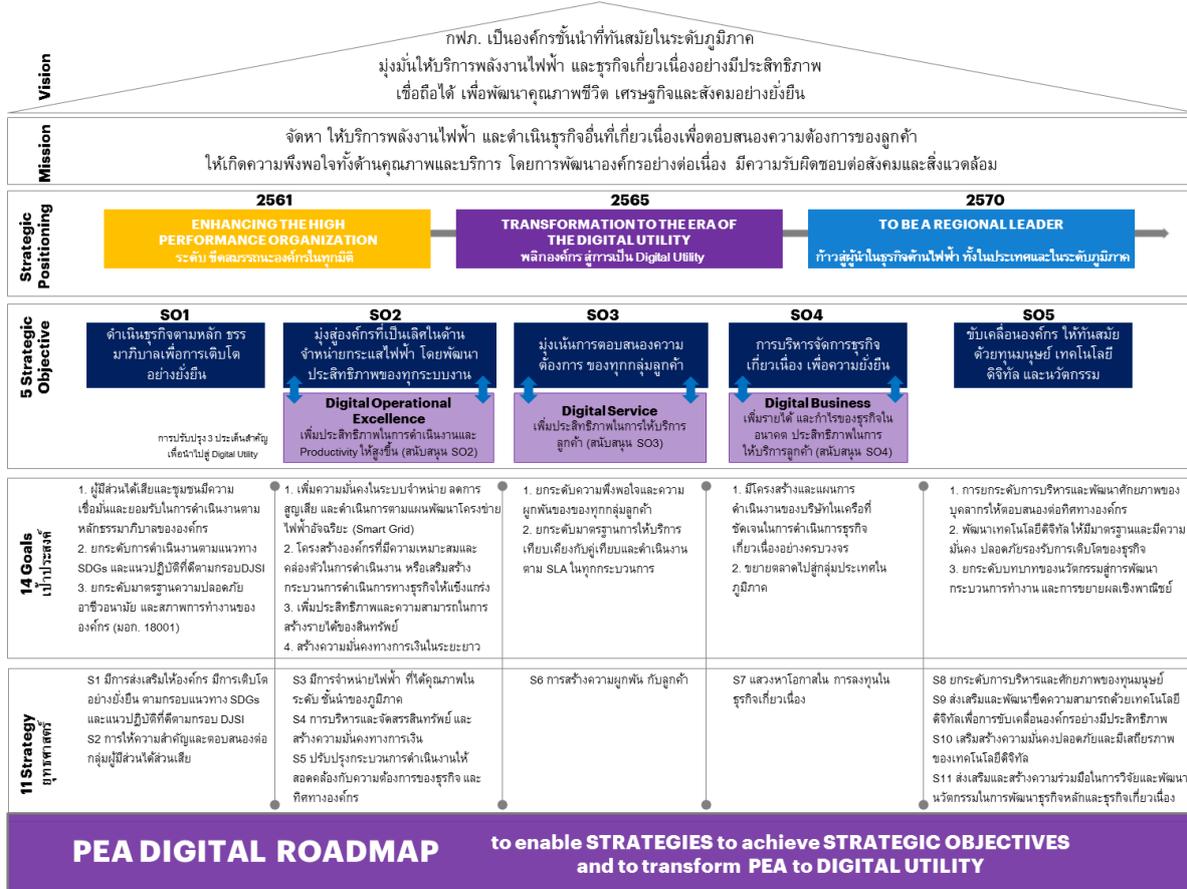


Figure 4: Summary of PEA Strategic Plan 2014 – 2023 and Digital Transformation Areas

2.2.2. PEA Executives’ Top Priorities

According to current stage analysis of PEA, the organization’s executives² provide business top priorities to become “Digital Utility” by 2022 which can be summarized into five folds as follows:

- **31% - to Develop Competent Human Capital** The most important area that needs to focus for becoming “Digital Utility” is to build strong foundation of human capital.

The top priorities of this area include:

- Build technology/digital capabilities in human capital
- Enhance human capital with learning and knowledge management
- Manage workforce capacity to align with business needs and responsibilities

² Top executive interview participants include PEA Governor and 14 PEA Vice Governors and 3 Head of the Offices which are conducted between August to September 2017.



- Create employee mindset to adopt changes
- Evaluate employee performance with a proper approach
- **19% - to Enhance Operational Excellence** for improving process efficiency in the following areas
 - Improve efficiency in internal processes
 - Enhance customer services with modern technology
 - Implement an ERP system to efficiently support business operations
 - Upgrade warehouse operations with modern warehouse technologies
 - Improve efficiency in capital project management
- **19% - to Create Collaborative & Flexible Workplace** across the organization through the following areas
 - Encourage collaborative organization culture
 - Adapt to changes from internal and external business rules
 - Revisit the organization operating model to support core business operations
 - Manage the technology-related initiatives through enterprise architecture
- **18% - to Unlock Data Value for Business Insights** and it is suggested by the following points
 - Become a data-driven organization to support organizational strategies and visualize the highlight to executives
 - Build Big Data and Data Analytics capability
 - Emphasize the use of customer analytics to serve customer with greater services
 - Focus on enterprise asset management in grid operations and maintenance
 - Update or refresh the status of data to near real-time for further analyses
- **14% - to Establish Robust Digital Technology Platform** for supporting the organization's growth in digital era and being ready to adopt technological changes in the future through the following points.
 - Focus on cyber security
 - Develop systematic enterprise content management
 - Build IT and OT integration platform
 - Explore Financial technology (FinTech) through external collaboration such as blockchain and wallet



2.2.3. PEA Current Stage Analysis

Regarding to the current operating model of PEA, it can be visualized the business value chain as shown in the following figure and there are three business capabilities including 1. Grid Capability (from grid planning and development to grid operation and maintenance) 2. Customer Capability (customer retail and customer services) and 3. Enterprise Capability (enterprise supporting functions)

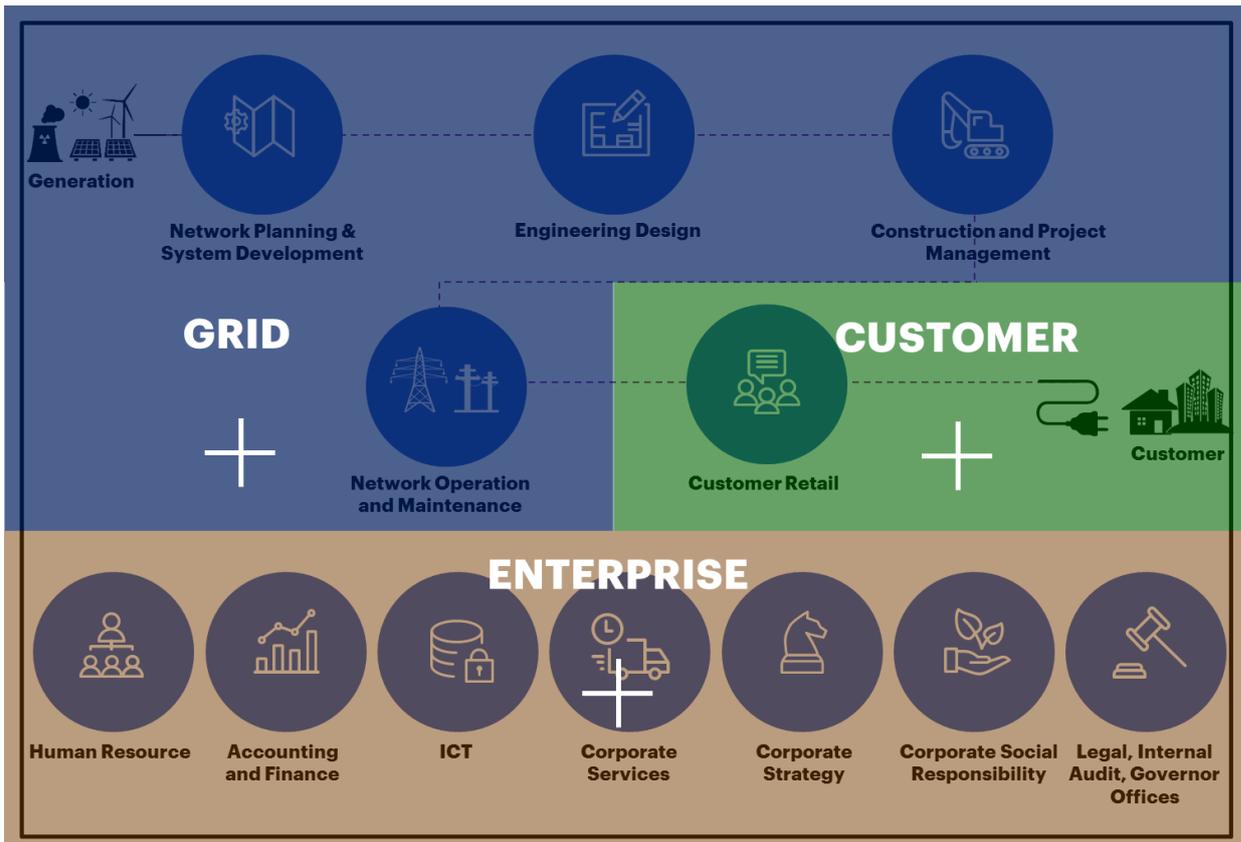


Figure 5: PEA's Business Capabilities

With respect to the current stage analysis, key business challenges can be summarized in each business capability as follows:

1. Key Business Challenges in Grid Capability

Grid Capability covers from grid planning, engineering design, construction and project management, to grid operations and maintenance. Key business challenges in the area are as follows:

- Lack of information to manage construction projects since there are some misalignments of data between planning and actual operation in budget estimation and project management



- The project status tracking system is needed to support capital project management since the current project management process mainly uses paper-based progress reports for most projects, while some projects use an adhoc update which is different from one project to another project via word document and excel spreadsheet. There is no single standard tool and single source of truth which leads to the challenge in collaboration between each function such as inventory management which requires a proper planning process from construction-related functions.
- Young-generation project managers are lack of experiences and there is no adequate supporting system to identify or highlight critical issues.
- There are enormous operational data in the operations; however, the use of this data in planning, control and maintenance is limited.

2. Key Business Challenges in Customer Capability

Customer Capability covers customer services and customer experience management through customer channels. Key business challenges in the area are as follows:

- Customer data does not maintain in a single source of truth and in a different format which leads to the challenge in customer experience management
- There are a lot of customer data; however, the use of this data is limited. If there is a customer analytics platform, it will support to launch marketing campaigns which are specific to each target group.
- Customer service evaluation process is different from one customer channel to another. The integration of those channels is also limited and there is lack of the use of the data across customer channels such as call center and smart queue system.
- The need to improve collaboration efficiency between functions within the organization is clear. For example, Customer Service functions require some supports from IT function to expand and/or build more front offices; however, PEA cannot meet the front office expansion plan due to poor collaboration between the two.

3. Key Business Challenges in Enterprise Capability

Enterprise Capability covers all supporting functions of PEA which include strategic planning, finance and accounting, human resources, procurement and inventory management,



corporate social responsibility, information and communication technology, plus legal office, audit office, and governor office. Key business challenges in the area are as follows:

- Tracking system of the organization's key performance indicators and the use of key organizational data sets are needed to support management decisions for operation improvements in the future. The data must be collected from trusted sources and update in the near real-time.
- The current supporting systems for enterprise content management are not user friendly which requires a lot of efforts to search an information. Also, the data are not up-to-date since there are no processes and clear defined responsibilities. This leads to poor knowledge management within the organization and it causes mistakes which normally are found by the audit process.
- The current ERP system does not fully support the existing operations so it leads to many enhancements in other systems.
- Lack of IT and OT integration in terms of system, process and data. IT and OT integration is needed to build the organization's centralized platform to support all business operations and resolve silo-based working culture.
- The challenges in human capital development is to embed learning management process into day-to-day works and to develop ICT skills for adapting any technological changes.

2.3. SWOT Analysis

Regarding to the study of external and internal factors and PEA current stage analysis which are mentioned above, SWOT Analysis can be summarized as follows:

Strength	Weakness
<ul style="list-style-type: none"> • Great grid network in terms of quality and reliability • PEA workforce specializes in transmission and distribution business • Large customers base covers the whole country • Strong foundation of technology which can support grid and customer capabilities • Strong brand image 	<ul style="list-style-type: none"> • Lack of tracking system to efficiently report the status of KPIs • Lack of the use of data in business management in planning process, operations and maintenance which including asset management, customer services and employee performance management



	<ul style="list-style-type: none"> • Inadequate knowledge management process and system • Fixed mindset and lack of adaptation to changes • Silo-based working environment
<p>Opportunity</p> <ul style="list-style-type: none"> • The government prioritizes and promotes digital services through Thailand 4.0 Policy and national digital initiatives such as Smart grid, EV, Solar Rooftop, and Digital Government • Technology such as cloud, mobile, big data, and IOT in digital era can support the organization to build high efficiency of digital platform and to innovate products and services for new business opportunities in relevant business 	<p>Threat</p> <ul style="list-style-type: none"> • Rapid technological changes and other private organizations where are more agile affects utilities marketplace • Rules and regulations from external auditors requires multiple approval processes • Limitations of rules and regulation for public organizations in doing businesses

3. PEA Digital Transformation Strategy

PEA Digital roadmap is aligned with PEA 4.0 framework, which is “Developing People through Innovation, Improving Processes with Technology”. Therefore, to transform PEA into Digital Utility in 2022, PEA Digital roadmap is developed under “PEA DX” program, “D” is digital and “X” is transformation.



Figure 6 : PEA Transformation under “PEA DX” program

3.1. PEA Digital Transformation Strategy and PEA Core Capability

PEA DX program transforms PEA’s core capability into following Digital strategy:



Digital Transformation Strategy	
 <p>DIGITAL ENERGY OPERATIONS</p>	<p>1. Digital Energy Operation - Creating digitally enabled grid and maximizing the convergence of power and information for grid reliability and operational excellence</p>
 <p>CONNECTED CUSTOMER</p>	<p>2. Connected Customer - Engaging the digital consumer in the new connected world. Designing a phenomenal customer experience and empowering digital trust</p>
 <p>NEXT GENERATION ENTERPRISE</p>	<p>3. Next Generation Enterprise - Digitizing enterprise capability to become strategic partner with business</p>
 <p>WORKFORCE OF THE FUTURE</p>	<p>4. Workforce of the Future - Inventing workforce for future digital operations and new talent marketplaces to drive the most profound business transformation</p>
 <p>DIGITAL PLATFORMS</p>	<p>5. Digital Platform - Building a robust ecosystem platform that beyond just a technology platform with flexible and agile delivery to scale at speed</p>

PEA will have Digital Energy Operation, Connected Customer and Next Generation Enterprise as core strategy to operate its core business driving by Workforce of the Future and having Digital Platforms as technology fundamental for business operation.

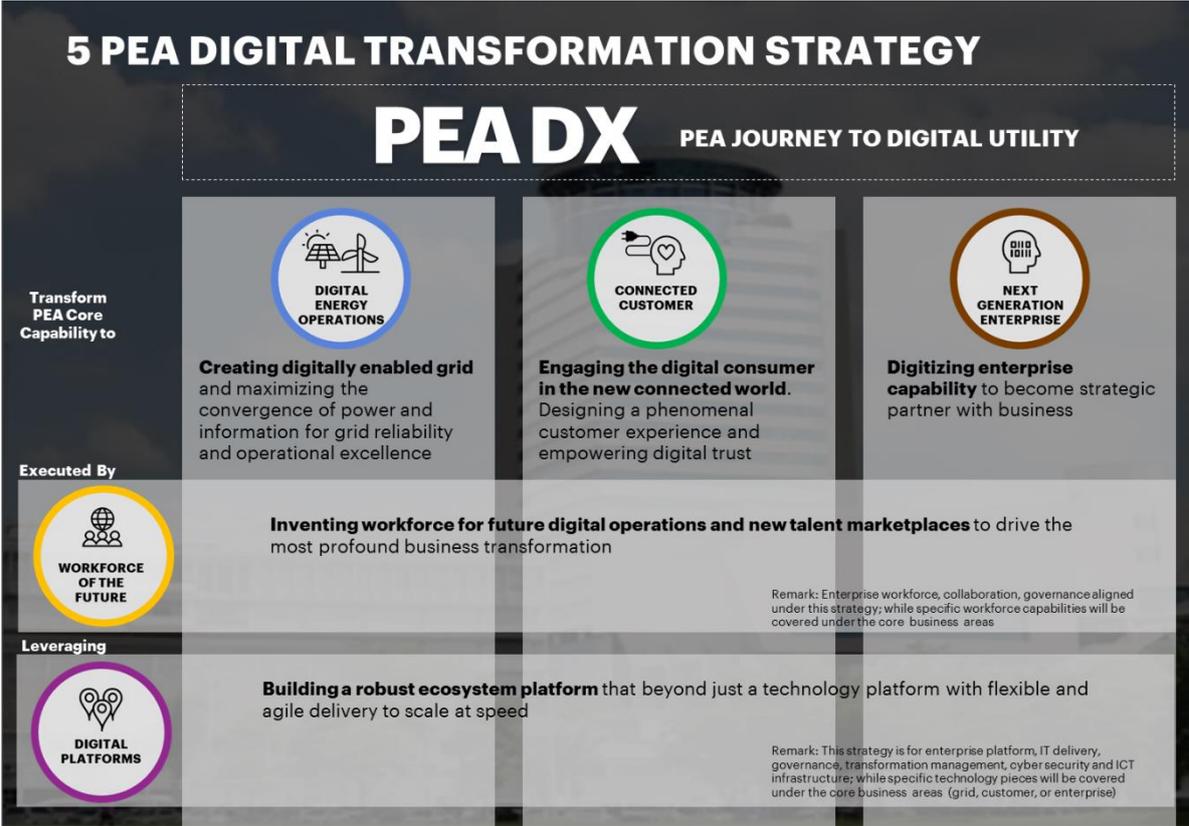


Figure 7: PEA Digital Transformation Strategies

3.2. Goals and KPIs of PEA Digital Roadmap

PEA Digital Roadmap’s objective is to support PEA to be Digital Utility along with its Strategic Positioning. PEA Digital Goals and KPIs can be categorized into two levels including Enterprise Goals & KPIs and Strategy Goals & KPIs.

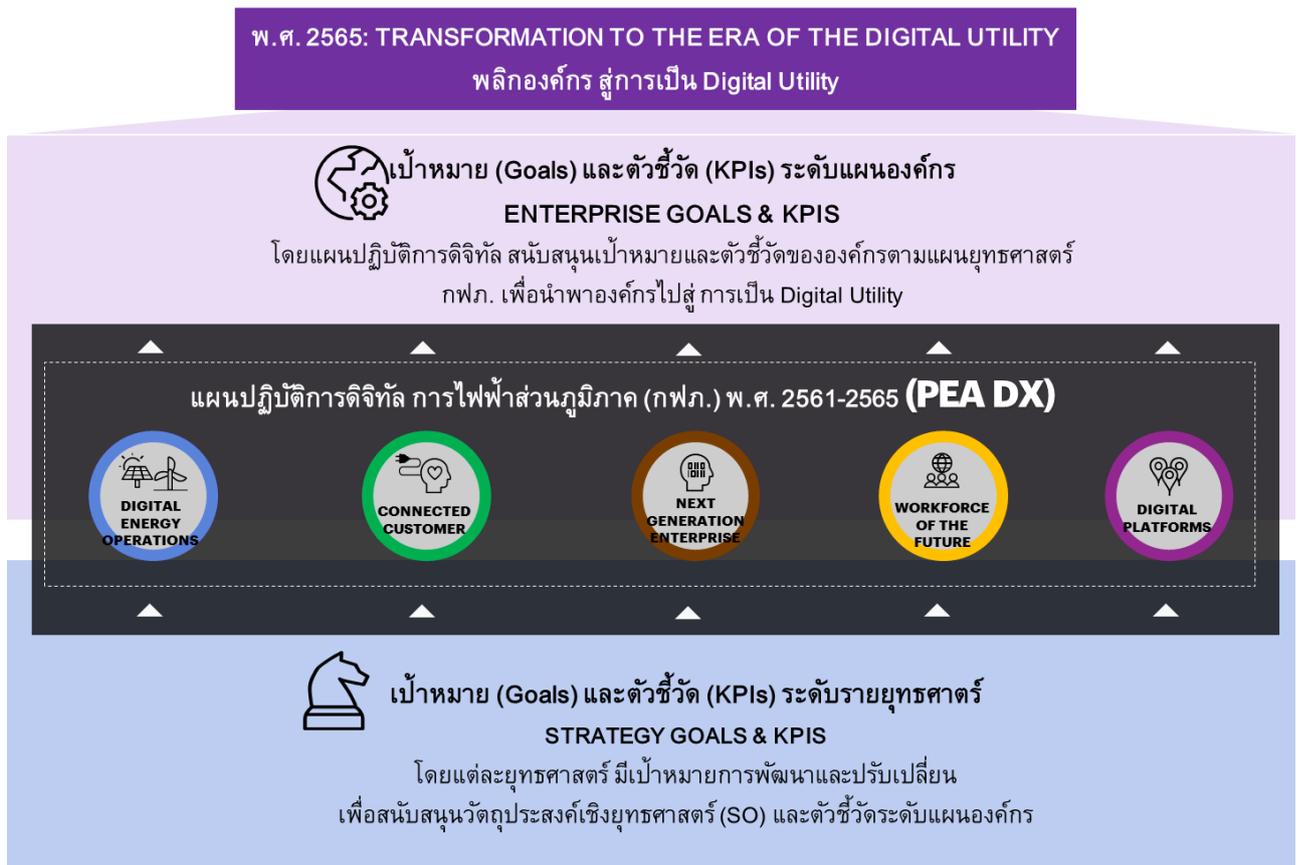


Figure 8: PEA Digital Goals and KPIs at Two Different Levels

Enterprise's Goals and KPIs of PEA Digital Roadmap

PEA Digital Roadmap has an important role to drive the organization to achieve its strategic objectives and to transform the organization to “Digital Utility” by 2022. Executive Digital Transformation Metric, namely “80/50” rule is identified as follows:

- Operational Agility from Digital drives operational expense is deducted by 80%
- New Revenue from Digital is generated by 50%

Not only Enterprise's Goals and KPIs of PEA Digital Roadmap are newly identified, but PEA Digital Roadmap also has an alignment with the goals and KPIs of Strategic Plan 2014 – 2023 (4th Revision) as shown in the below table.



พ.ศ. 2565: TRANSFORMATION TO THE ERA OF THE DIGITAL UTILITY

พลิกองค์กรสู่การเป็น Digital Utility

Executive Digital Transformation Metric “80/50” by 2022

- Operational Agility from Digital drives operational expense is deducted by 80%
- New Revenue from Digital is generated by 50%

PEA Digital Roadmap Goals (Alignment with PEA Strategic Plan)

- Enhance grid network by implementing Smart Grid technology and analyzing data for high value network and assets (SO2)
- Increase productivity and capability of asset income generation (SO2)
- Sustainably create financial stability (SO2)
- Level up customer service standard regarding to that of benchmarks and follow SLA in conducting operational procedure (SO3)
- Enhance customer satisfaction and engagement (SO3)
- Build trust to all stakeholders through good governance (SO1)
- Support new business development for new income source of PEA (Support SO4)
- Using innovation to develop working processes and commercial extension (SO5)
- Invent workforce for future digital operations and new talent marketplaces to drive the most profound business transformation (SO5)
- Develop and standardize digital technology for the new opportunity growth of PEA (SO5)

Enterprise’s KPIs (Alignment with PEA Strategic Plan)

- Services Level Agreement (SLA) of the core process and the related process is standardized by using technology for process improvement
- Archieve the target of SAIFI/SAIDI according to The Twelfth National Economic and Social Development 2560-2564
- Archieve Asset Management Standard (ISO55000)
- Meet or exceed the target of customer satisfaction index at the score of 4.50
- Meet the target of customer satisfaction for key accounts at the score of 4.41
- Meet or exceed the target of stakeholder satisfaction survey at the score of 4
- Meet the target of employee engagement score at 4.50
- Meet or exceed 80 percent of employees who meet the target competency level
- Have at least 3 key processes which are applied ICT to improve process efficiency





Strategy's Goals and KPIs of PEA Digital Roadmap

Each PEA Digital Transformation Strategy is formulated to identify the transformation capabilities including Grid, Customer, Enterprise, Human Capital, and ICT which have the strategy's goals and KPIs as follows:



Digital Transformation Strategy	Goal	KPI
<p>1. Digital Energy Operations</p> 	<p>1. Grid</p> <p>Develop grid operation by</p> <ul style="list-style-type: none"> - Create collaboration among functions - Develop analytics capacity by maximizing grid capacity - Support Smart Grid 	<ol style="list-style-type: none"> 1. Operating expense in grid is deducted by 10-20% 2. Employee expense is reduced by 2.5-10% due to 10-25% increase in grid operation effectiveness 3. Time to complete construction projects is reduced by 10% (Lean Construction)
<p>2. Connected Customer</p> 	<p>2. Customer</p> <p>Enhance customer experience by having customer centric as concept to develop customer journey. Engaging the digital consumer in the new connected world. Designing a phenomenal customer experience and empowering digital trust</p> <ul style="list-style-type: none"> - Enhance customer experience through Omni Channel - Have modern customer service channel via digital technology - Have proactive customer service 	<ol style="list-style-type: none"> 1. Operating expense in customer services is deducted by 5-10% 2. Customer services expense is decreased by 500 FTE 3. Customer satisfaction is increased by 5% 4. Customer interaction through digital channel with 15% increase



Digital Transformation Strategy	Goal	KPI
3. Next Generation Enterprise 	3. Enterprise Enhance the role to be PEA Strategic Partner to support grid and customer service <ul style="list-style-type: none"> - Support manager's decision with enterprise content management and insight analytics - Increase agility and productivity by CBS2 - Have knowledge management for learning fundamental to create innovation sustainability 	<ol style="list-style-type: none"> 1. Operating expense along business value chain is deducted by 10-15% 2. Operating time is more efficient accounting to 15-25% increase (using FTEs measurement) 3. Contents/ information management & maintenance expense is reduced by 30%
4. Workforce of the Future 	4. Human Resource Invent workforce for future digital operations and new talent marketplaces to drive the most profound business transformation <ul style="list-style-type: none"> - Create digital technology comprehension, awareness, and skills to PEA workforce - Create innovation through digital learning 	<ol style="list-style-type: none"> 1. Training and development expense for employees is reduced by 70% 2. Employee support & operating expense is reduced by 30% 3. Employee sourcing expense is decreased by 30% due to effective procedure of employee selection that meet business needs

Digital Transformation Strategy	Goal	KPI
	<ul style="list-style-type: none"> - Support the learning of personnel according to the individual capabilities group (Core Competency), assessment, and performance evaluation - Build up attitude to support PEA digital transformation 	
<p>5. Digital Platform</p> 	<p>5. ICT</p> <p>Build a robust ecosystem platform that beyond just a technology platform with flexible and agile delivery to scale at speed</p> <ul style="list-style-type: none"> - Adjust digital technology management procedure with flexible and agile delivery for every workstream usage. - Focus on collaboration of system and data - Strengthen and standardize ICT structure with safetiness 	<ol style="list-style-type: none"> 1. Overall ICT-related expense is reduced by 10-20% 2. Time to serve ICT with other functions is reduced from the existing SLA by 10-20% 3. Employee satisfaction in the use of ICT is increased by 10% 4. Initiatives and projects in Digital Roadmap are met the plan over 80%

3.3. PEA Strategic Plan & Digital Plan Alignment

PEA STRATEGIC PLAN & DIGITAL PLAN ALIGNMENT

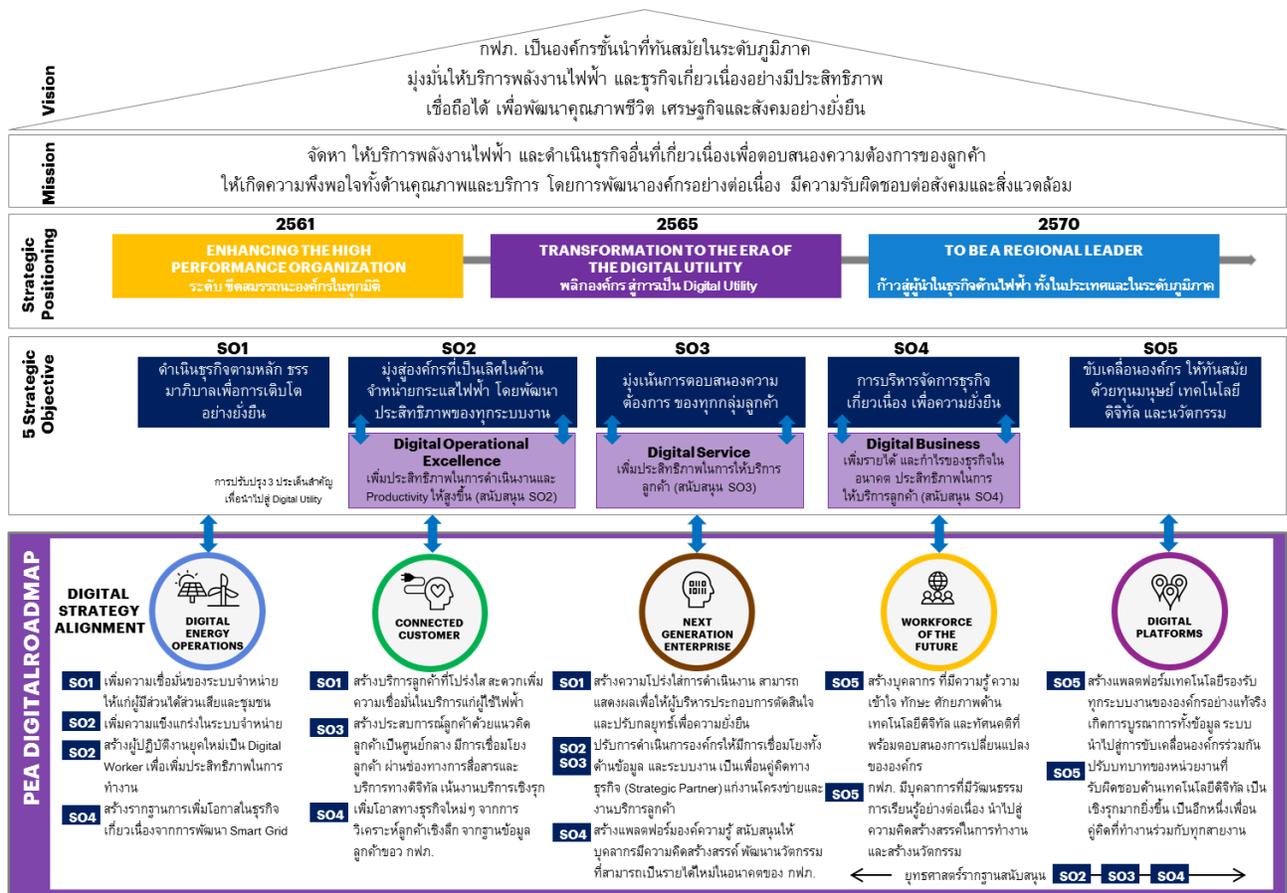


Figure 9: PEA Strategic Plan & Digital Plan Alignment

PEA Strategic Objective & Digital Transformation Strategy Alignment

PEA Strategic Objective	Digital Transformation Strategy
SO1: Good Governance Objective: Build trust to all stakeholders through good governance	<p>PEA Strategic Objective & Digital Transformation Strategy Alignment</p> <p>Digital Energy Operations</p> <ul style="list-style-type: none"> Enhance grid reliability by digital technology, creating trust to stakeholders and community.



PEA Strategic Objective	Digital Transformation Strategy
	<div data-bbox="516 254 651 386"> <p>CONNECTED CUSTOMER</p> </div> <p data-bbox="695 300 987 331">Connected Customer</p> <ul data-bbox="565 401 1430 489" style="list-style-type: none"> • Create transparency, convenient and modern service by having digital channel and service for customers. <div data-bbox="516 558 651 690"> <p>NEXT GENERATION ENTERPRISE</p> </div> <p data-bbox="695 611 1065 642">Next Generation Enterprise</p> <ul data-bbox="565 711 1403 911" style="list-style-type: none"> • Digitize enterprise capability to become strategic partner with business • Enhance collaboration within PEA to create transparency and standardized procedure
<p data-bbox="123 936 378 1024">SO2: Grid Operation Excellence</p> <p data-bbox="123 1104 386 1136">Related Digital Point</p> <div data-bbox="123 1152 462 1270" style="background-color: #d8bfd8; padding: 5px;"> <p>Digital Operational Excellence เพิ่มประสิทธิภาพในการดำเนินงานและ Productivity ให้สูงขึ้น (สนับสนุน SO2)</p> </div> <p data-bbox="123 1297 253 1329"><u>Objective:</u></p> <ul data-bbox="123 1356 480 1892" style="list-style-type: none"> - Enhance grid network by implementing Smart Grid technology and analyzing data for high value network and assets - Increase productivity and capability of asset income generation - Sustainably create financial stability 	<p data-bbox="505 936 1435 968"><u>PEA Strategic Objective & Digital Transformation Strategy Alignment</u></p> <div data-bbox="516 1037 651 1169"> <p>DIGITAL ENERGY OPERATIONS</p> </div> <p data-bbox="800 1089 1144 1121">Digital Energy Operations</p> <ul data-bbox="565 1188 1474 1388" style="list-style-type: none"> • Enhance grid network by implementing Smart Grid technology and analyzing data for high value network and assets • Build up new generation users to be digital worker for more efficient operation <div data-bbox="516 1457 651 1589"> <p>NEXT GENERATION ENTERPRISE</p> </div> <p data-bbox="800 1514 1170 1545">Next Generation Enterprise</p> <ul data-bbox="565 1612 1466 1755" style="list-style-type: none"> • Adjust operation system for integrated data and operating system. • Digitize enterprise capability to become strategic partner with business



PEA Strategic Objective	Digital Transformation Strategy
	<div data-bbox="516 254 651 384"> <p>WORKFORCE OF THE FUTURE</p> </div> <p data-bbox="800 302 1130 331">Workforce of the Future</p> <ul data-bbox="570 401 1458 485" style="list-style-type: none"> • Invent workforce for future digital operations and new talent marketplaces to drive the most profound business transformation <div data-bbox="516 554 651 684"> <p>DIGITAL PLATFORMS</p> </div> <p data-bbox="800 606 1011 636">Digital Platform</p> <ul data-bbox="570 705 1458 789" style="list-style-type: none"> • Build a robust ecosystem platform that beyond just a technology platform with flexible and agile delivery to scale at speed
<p data-bbox="123 821 412 850">SO3: Customer Centric</p> <p data-bbox="123 932 383 961"><u>Related Digital Point</u></p> <div data-bbox="123 974 435 1087" style="background-color: #d8bfd8; padding: 5px;"> <p data-bbox="199 993 357 1016">Digital Service</p> <p data-bbox="155 1018 401 1068">เพิ่มประสิทธิภาพในการให้บริการลูกค้า (สนับสนุน SO3)</p> </div> <p data-bbox="123 1104 245 1134"><u>Objective</u></p> <ul data-bbox="123 1161 475 1640" style="list-style-type: none"> - Level up customer service standard regarding to that of benchmarks and follow SLA in conducting operational procedure - Enhance customer satisfaction and engagement 	<p data-bbox="505 821 1430 850"><u>PEA Strategic Objective & Digital Transformation Strategy Alignment</u></p> <div data-bbox="516 863 651 993"> <p>CONNECTED CUSTOMER</p> </div> <p data-bbox="699 915 987 945">Connected Customer</p> <ul data-bbox="570 1014 1442 1213" style="list-style-type: none"> • Enhance customer experience by having customer centric as concept to develop customer journey. Engaging the digital consumer in the new connected world. Designing a phenomenal customer experience and empowering digital trust. <div data-bbox="516 1283 651 1413"> <p>NEXT GENERATION ENTERPRISE</p> </div> <p data-bbox="699 1335 1065 1365">Next Generation Enterprise</p> <ul data-bbox="570 1434 1360 1518" style="list-style-type: none"> • Adjust operation system for integrated data and operating system to become strategic partner with business <div data-bbox="516 1703 651 1833"> <p>WORKFORCE OF THE FUTURE</p> </div> <p data-bbox="699 1755 1027 1785">Workforce of the Future</p>



PEA Strategic Objective	Digital Transformation Strategy
	<ul style="list-style-type: none"> Invent workforce for future digital operations and new talent marketplaces to drive the most profound business transformation <div data-bbox="516 422 651 554"> <p>DIGITAL PLATFORMS</p> </div> <p>Digital Platform</p> <ul style="list-style-type: none"> Build a robust ecosystem platform that beyond just a technology platform with flexible and agile delivery to scale at speed
<p>SO4: Sustainable Development</p> <p>Related Digital Point</p> <div data-bbox="125 955 410 1071" style="background-color: #e0e0ff; padding: 5px;"> <p>Digital Business เพิ่มรายได้ และกำไรของธุรกิจในอนาคต ประสิทธิภาพในการให้บริการลูกค้า (สนับสนุน SO4)</p> </div> <p><u>Objective</u></p> <p>Support new business development for new income source of PEA by extending customer base regionally</p>	<p>PEA Strategic Objective & Digital Transformation Strategy Alignment</p> <div data-bbox="516 783 651 915"> <p>DIGITAL ENERGY OPERATIONS</p> </div> <p>Digital Energy Operations</p> <ul style="list-style-type: none"> Build up new business opportunity by developing Smart Grid technology. <div data-bbox="516 1035 651 1167"> <p>CONNECTED CUSTOMER</p> </div> <p>Connected Customer</p> <ul style="list-style-type: none"> Increase new business opportunity by analyzing PEA customer data deeply. <div data-bbox="516 1287 651 1419"> <p>NEXT GENERATION ENTERPRISE</p> </div> <p>Next Generation Enterprise</p> <ul style="list-style-type: none"> Create knowledge platform and support innovative ideas for future PEA income source. <div data-bbox="516 1591 651 1724"> <p>WORKFORCE OF THE FUTURE</p> </div> <p>Workforce of the Future</p> <ul style="list-style-type: none"> Invent workforce for future digital operations and new talent marketplaces to drive the most profound business transformation



PEA Strategic Objective	Digital Transformation Strategy
	<div data-bbox="516 254 652 386" style="display: inline-block; vertical-align: top;">  </div> <div data-bbox="695 300 909 333" style="display: inline-block; vertical-align: top; margin-left: 20px;"> <p>Digital Platform</p> </div> <ul data-bbox="565 401 1429 543" style="list-style-type: none"> • Build a robust ecosystem platform that beyond just a technology platform with flexible and agile delivery to scale at speed
<p>SO5: Human Capital, Digital Technology, Innovation Driven Organization</p> <p><u>Objective</u></p> <ul style="list-style-type: none"> - Using innovation to develop working processes and commercial extension - Invent workforce for future digital operations and new talent marketplaces to drive the most profound business transformation - Develop and standardize digital technology for the new opportunity growth of PEA 	<p><u>PEA Strategic Objective & Digital Transformation Strategy Alignment</u></p> <div data-bbox="516 621 652 753" style="display: inline-block; vertical-align: top;">  </div> <div data-bbox="695 667 1027 701" style="display: inline-block; vertical-align: top; margin-left: 20px;"> <p>Workforce of the Future</p> </div> <ul data-bbox="565 768 1412 974" style="list-style-type: none"> • Invent workforce for future digital operations and new talent marketplaces to drive the most profound business transformation • Create innovative ideas for future innovation through trainings <div data-bbox="516 989 652 1121" style="display: inline-block; vertical-align: top;">  </div> <div data-bbox="695 1035 909 1068" style="display: inline-block; vertical-align: top; margin-left: 20px;"> <p>Digital Platform</p> </div> <ul data-bbox="565 1136 1437 1394" style="list-style-type: none"> • Build a robust ecosystem platform that beyond just a technology platform with flexible and agile delivery to scale at speed • Adjust ICT workstream’s role to become more proactive and to become strategic partner with other workstreams <p>However, “Workforce of the Future” and “Digital Platform” are fundamental strategy that support and drive every PEA business capabilities to achieve strategic objectives of SO2, SO3, and SO4</p>

3.4. PEA Digital Roadmap Development Principle

To achieve strategic positioning to be Digital Utility within 2565, PEA need to consider its digital roadmap to conduct along with the principle “At Speed”- doing quick, delivering fast outcomes and “At Scale”- transforming across PEA. However, transformation is not about the responsible of one single workstream, every PEA workstream will be involved and transformed. PEA Digital roadmap will be developed under “Think Big, Smart Small, Build Fast, and Scale for Value”

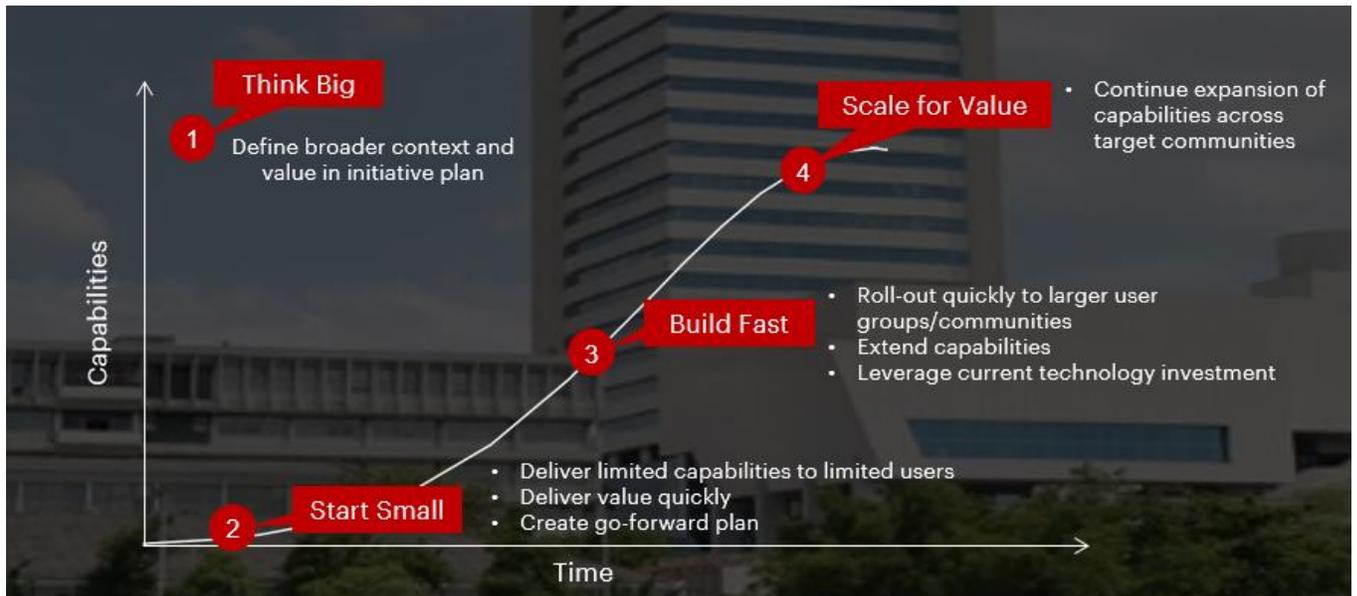


Figure 10: PEA Digital Roadmap Development Principle

- **Think Big** – Analyze and design overall picture of PEA capabilities to be able to define target stage of development and to be able to integrate processes, workforce, and related technology. The outcome is “Think Big” is to be able to define broader context and value in initiative plan.
- **Start Small** – Implement initiative plan to limited users by conducting pilot to deliver value quickly and to create go-forward plan.
- **Build Fast** – Extend capabilities from pilot outcome to larger user and leverage current technology investment.
- **Scale for Value** – Continue expansion of capabilities across target communities

According to “At Speed” and “At Scale” principle, PEA Digital Roadmap divides journey to digital utility into three phases as follow:

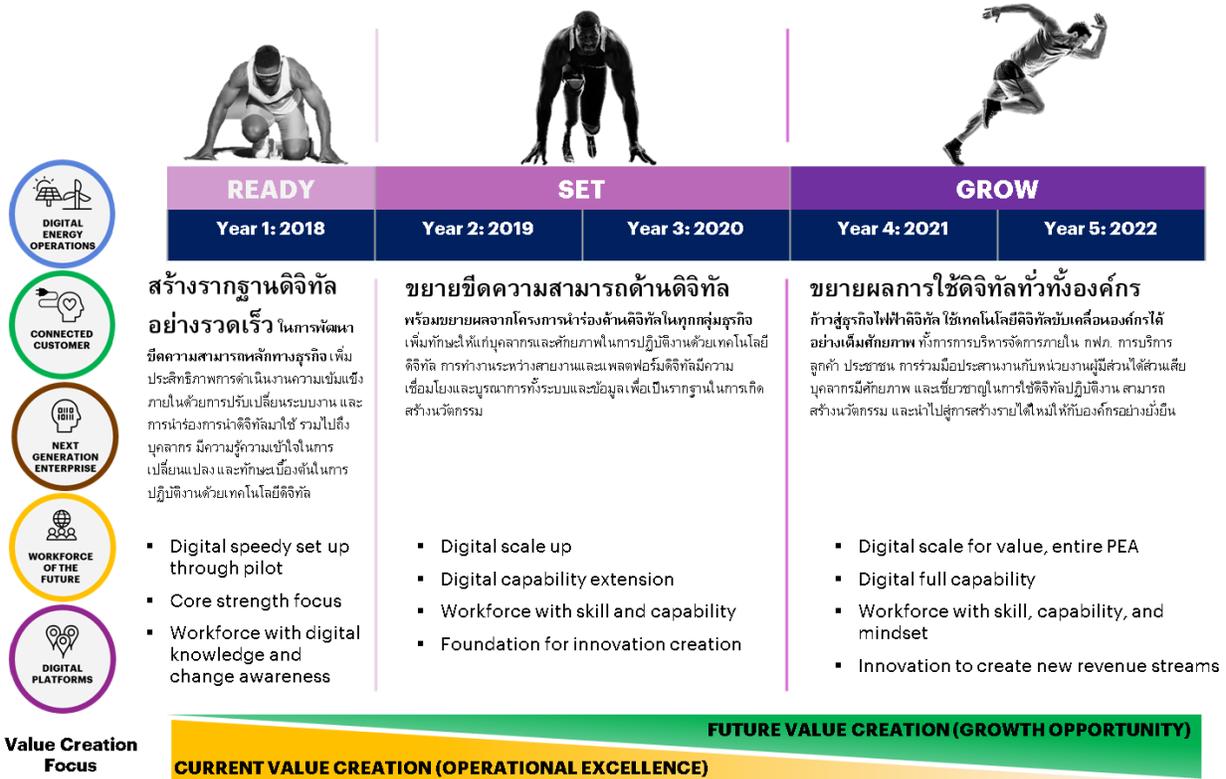


Figure 11: PEA 5-Year Journey to Digital Utility (Ready-Set-Grow)

Phase 1: Ready (2561)

Digitize the core with transformational improvements that enhance customer engagement, enhance network resilience and increase productivity.

Phase 2: Set (2562-2563)

Establish digital competencies and platforms that enable step-change improvement and lay a foundation for innovation.

Phase 3: Grow (2564-2565)

Introduce new digitally enabled products, services, network management approaches and customer experience potentially under new business models.

PEA Digital Roadmap will create value to PEA as follow:

1. **Current Value** – In phase “Ready” and “Set”, digital technology will be used to increase productivity and effectiveness of PEA operation (Operational Excellence).



2. **Future Value** – After PEA has accomplished operational excellence and innovative workforce, digital technology will enhance growth opportunity in the phase “Grow”

4. PEA Digital Roadmap

PEA Digital Roadmap has initiatives as follows:

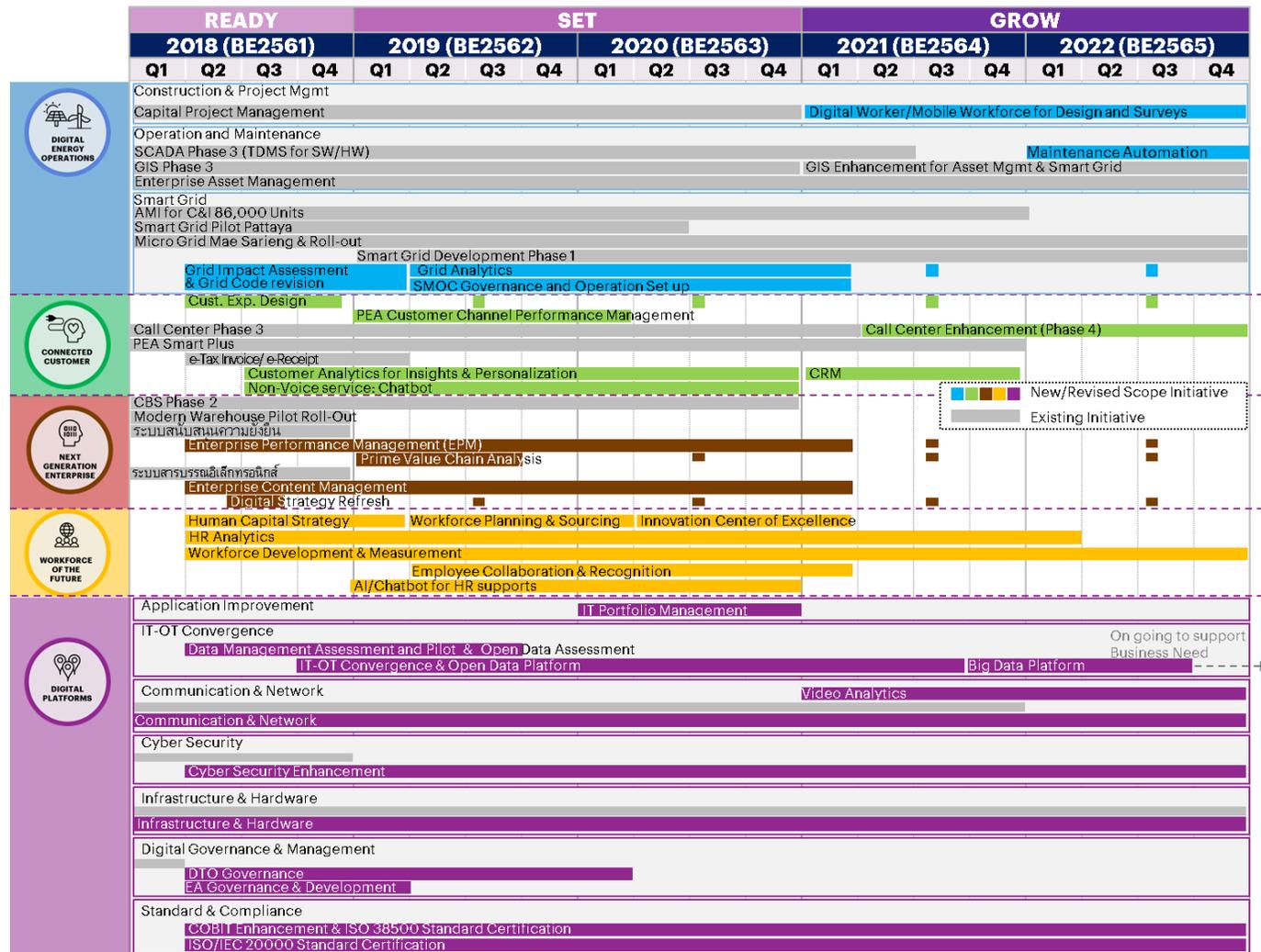


Figure 12: PEA Digital Roadmap

Remark: Initiative period covers the time for system development and setting (does not cover the time for internal approval period)

Initiatives are divided by digital strategic as follows:

1. Digital Energy Operation

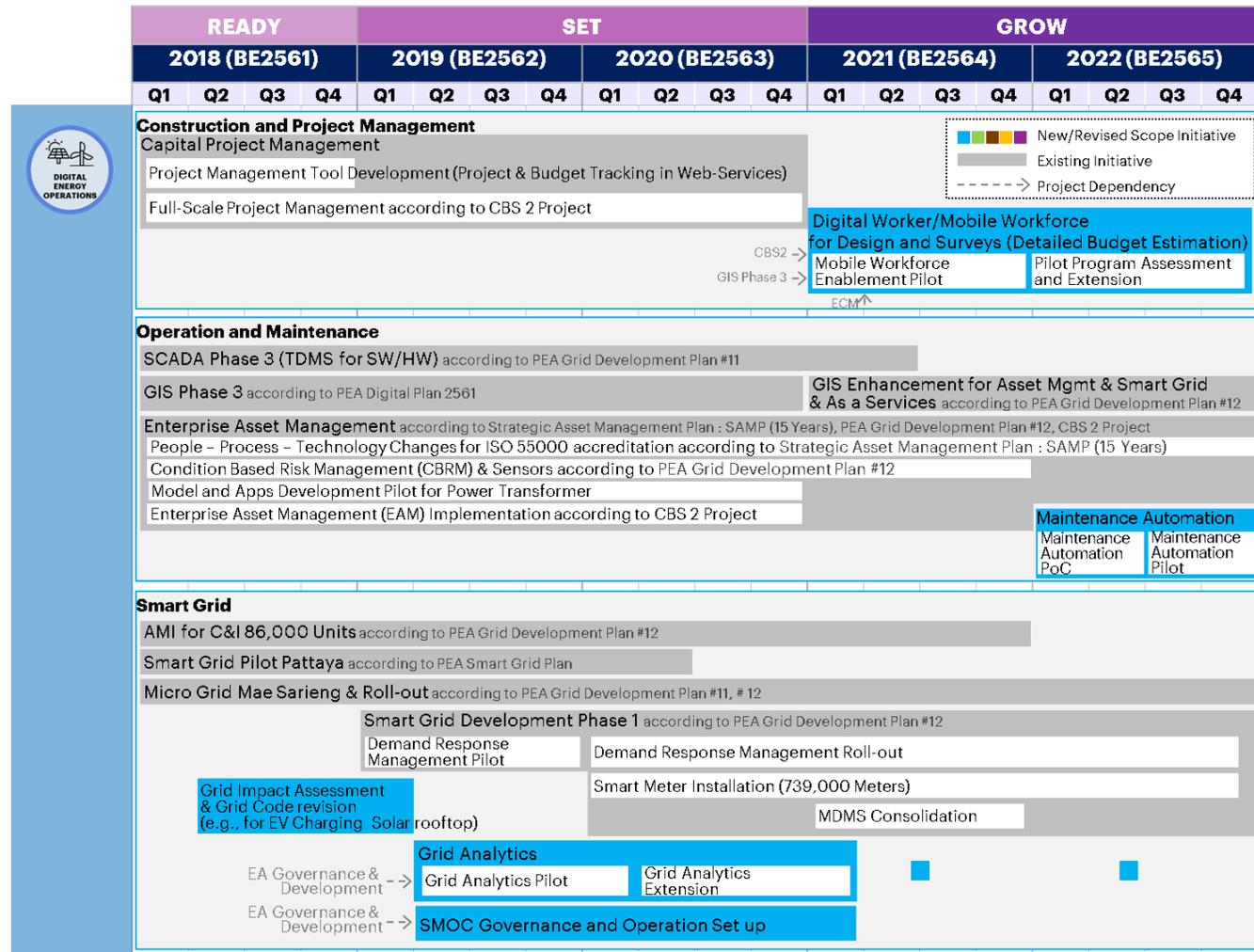


Figure 13 : Initiatives and Projects under Digital Energy Operation

Initiative/Project		Owner	Phase				
			Ready	Set		Grow	
			2561	2562	2563	2564	2565
No.	Digital Energy Operations						
	PEA Digital Roadmap						
1	Digital Worker/Mobile Workforce for Design & Surveys	CPM	-	-	-	78.40	235.73
2	Maintenance Automation	OM	-	-	-	-	143.20
3	Grid Impact Assessment & Grid Code Revision	PSD	26.63	-	-	-	-
4	Grid Analytics	OM	-	33.80	205.57	-	-
5	SMOC Governance and Operation Setup	OM	-	128.18	-	-	-
	Other Plans						
1	Capital Project Management	CPM	-	-	-	-	-
2	SCADA Phase 3 (TDMS for SW/HW)	OM	-	-	-	-	-
3	GIS Phase 3	PSD	-	1,548.95	-	-	-

Initiative/Project		Owner	Phase				
			Ready	Set		Grow	
			2561	2562	2563	2564	2565
No.	Digital Energy Operations						
4	GIS Enhancement for Asset Management & Smart Grid & As a Services	PSD	-	-	-	1,340.00	-
5	Enterprise Asset Management	OM	-	956.00	-	-	-
6	AMI for C&I 86,000 Units	OM	2,200.00	-	-	-	-
7	Smart Grid Pilot Pattaya	PSD	-	-	-	-	-
8	Micro Grid Mae Sarieng & Roll-out	PSD	1,380.00	-	-	-	-
9	Smart Grid Development Phase 1	PSD	-	6,950.00	-	-	-
Budget of PEA Digital Roadmap 2018-2022			26.63	161.98	205.57	78.40	378.93
Budget of other plans			3,580.00	9,454.95	-	1,340.00	-

Remark - Dark grey area shows initiatives/projects period

2. Connected Customer

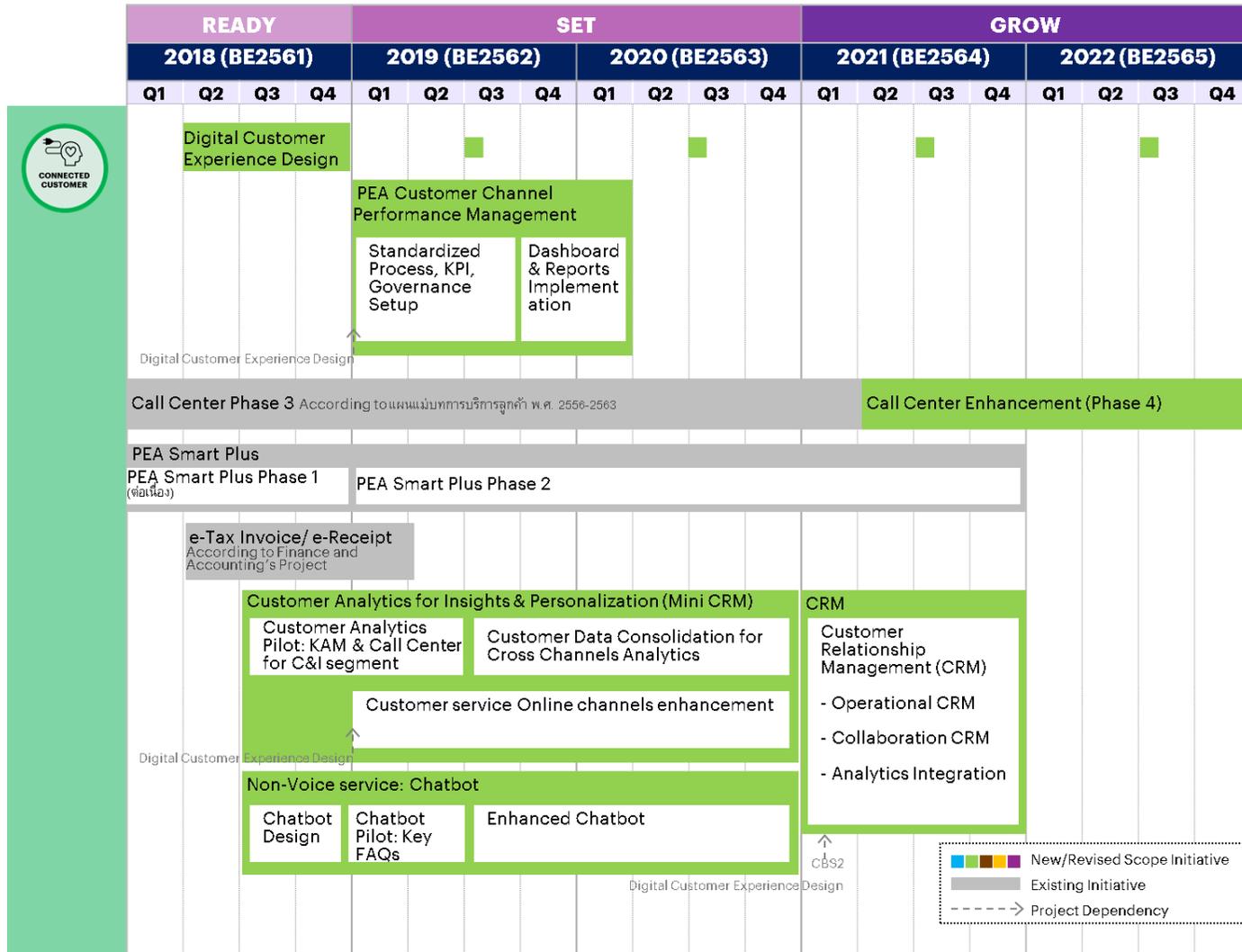


Figure 14 : Initiatives and Projects under Connected Customer

Initiative/Project		Owner	Phase					
			Ready	Set		Grow		
			2561	2562	2563	2561	2565	
No.	Connected Customer							
	PEA Digital Roadmap							
1	Customer Experience Design	R1-R4	16.20	16.20	16.20	16.20	16.20	
2	Call Center Enhancement (Phase 4)	ICT	-	-	-	299.85	-	
3	Customer Analytics for Insights & Personalization	R1-R4	38.43	62.90	-	-	-	
4	Customer Relationship Management (CRM)	R1-R4	-	-	-	105.04	-	
5	Non-Voice Service: Chatbot	ICT	5.40	34.60	-	-	-	
6	PEA Customer Channel Performance Management	R1-R4	-	25.20	-	-	-	
	Other Plans							
1	Call Center Phase 3	ICT	49.68	49.68	49.68	12.42	-	
2	PEA Smart Plus	R3	-	25.78	-	-	-	

Initiative/Project		Owner	Phase					
			Ready	Set		Grow		
			2561	2562	2563	2561	2565	
No.	Connected Customer							
3	e-Tax Invoice/ e-Receipt	AF	-	-	-	-	-	-
	Budget of PEA Digital Roadmap 2018-2022		60.03	138.90	16.20	421.09	16.20	
	Budget of other plans		49.68	75.46	49.68	12.42	-	

Remark - Dark grey area shows initiatives/projects period

3. Next Generation Enterprise

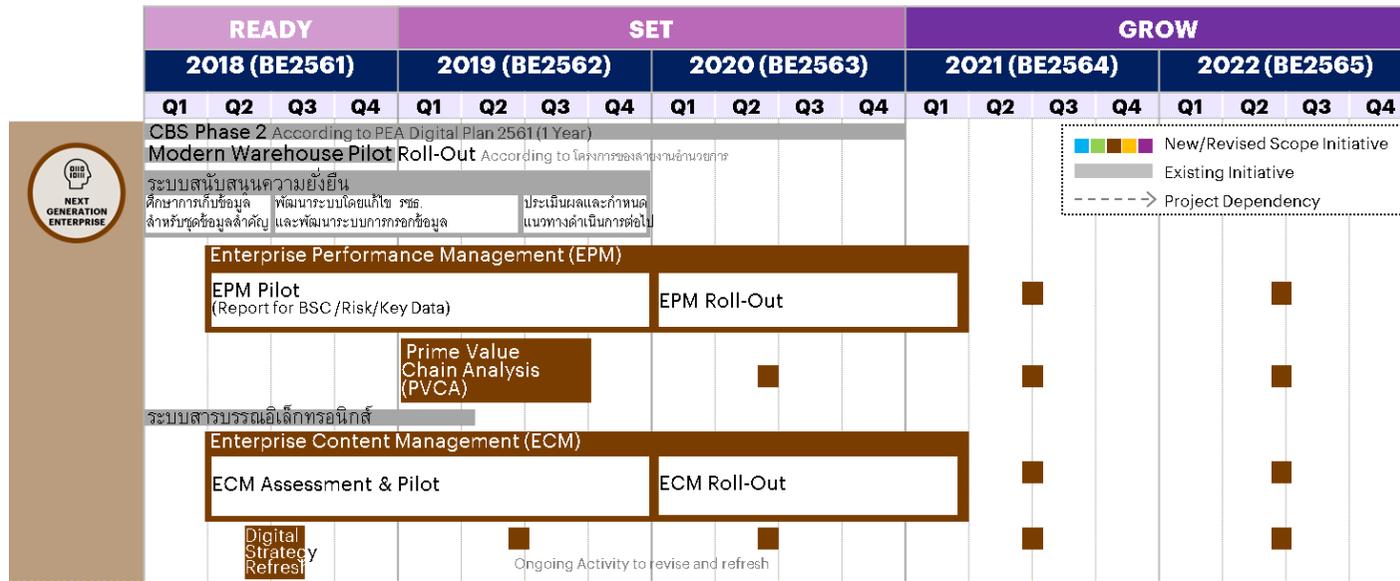


Figure 15 : Initiatives and Projects under Next Generation Enterprise

No.	Initiative/Project	Owner	Phase					
			Ready	Set		Grow		
			2561	2562	2563	2561	2565	
	Next Generation Enterprise							
	PEA Digital Roadmap							
1	Enterprise Performance Management (EPM)	ICT	69.80	-	117.40	-	-	

Initiative/Project		Owner	Phase					
			Ready	Set		Grow		
			2561	2562	2563	2561	2565	
No.	Next Generation Enterprise							
2	Prime Value Chain Analysis	CS	-	32.40	-	-	-	-
3	Enterprise Content Management (ECM)	ICT	59.40	-	252.60	-	-	-
4	Digital Strategy Refresh	ICT	9.90	9.90	9.90	14.40	9.90	
	Other Plans							
1	CBS Phase 2	ICT	3,591.46	-	-	-	-	-
2	Modern Warehouse Pilot Roll-out	GS	-	-	-	-	-	-
3	Sustainable Support System	CSR	-	-	-	-	-	-
4	Electronic Document System	ICT	8.00	-	-	-	-	-
	Budget of PEA Digital Roadmap 2018-2022		139.10	42.30	379.90	14.40	9.90	
	Budget of other plans		3,599.46	-	-	-	-	-

Remark - Dark grey area shows initiatives/projects period

4. Workforce of the Future

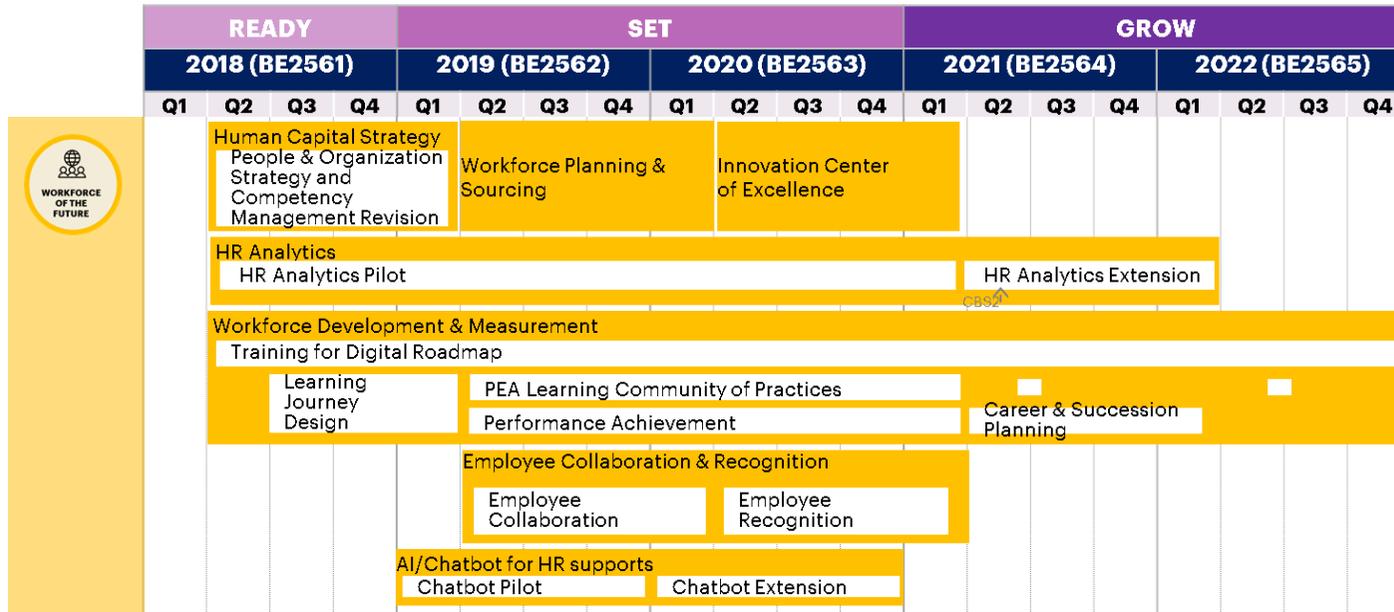


Figure 16 : Initiatives and Projects under Workforce of the Future

No.	Initiative/Project	Owner	Phase					
			Ready	Set		Grow		
			2561	2562	2563	2561	2565	
	Workforce of the Future							
	PEA Digital Roadmap							

Initiative/Project		Owner	Phase				
			Ready	Set		Grow	
			2561	2562	2563	2561	2565
No.	Workforce of the Future						
1	Human Capital Strategy	HR	18.00	-	-	-	-
2	Employee Collaboration & Recognition	HR	-	68.40	39.60	-	-
3	Workforce Development & Measurement	HR	29.65	175.61	1.92	34.52	1.32
4	Innovation Center of Excellence	PSD	-	-	21.60	-	-
5	Workforce Planning & Sourcing	HR	-	32.40	-	-	-
6	AI/ Chatbot for HR supports	HR	-	20.00	11.20	-	-
7	HR Analytics	HR	28.20	-	-	22.20	-
Budget of PEA Digital Roadmap 2018-2022			75.85	296.41	74.32	56.72	1.32

Remark - Dark grey area shows initiatives/projects period

5. Digital Platform

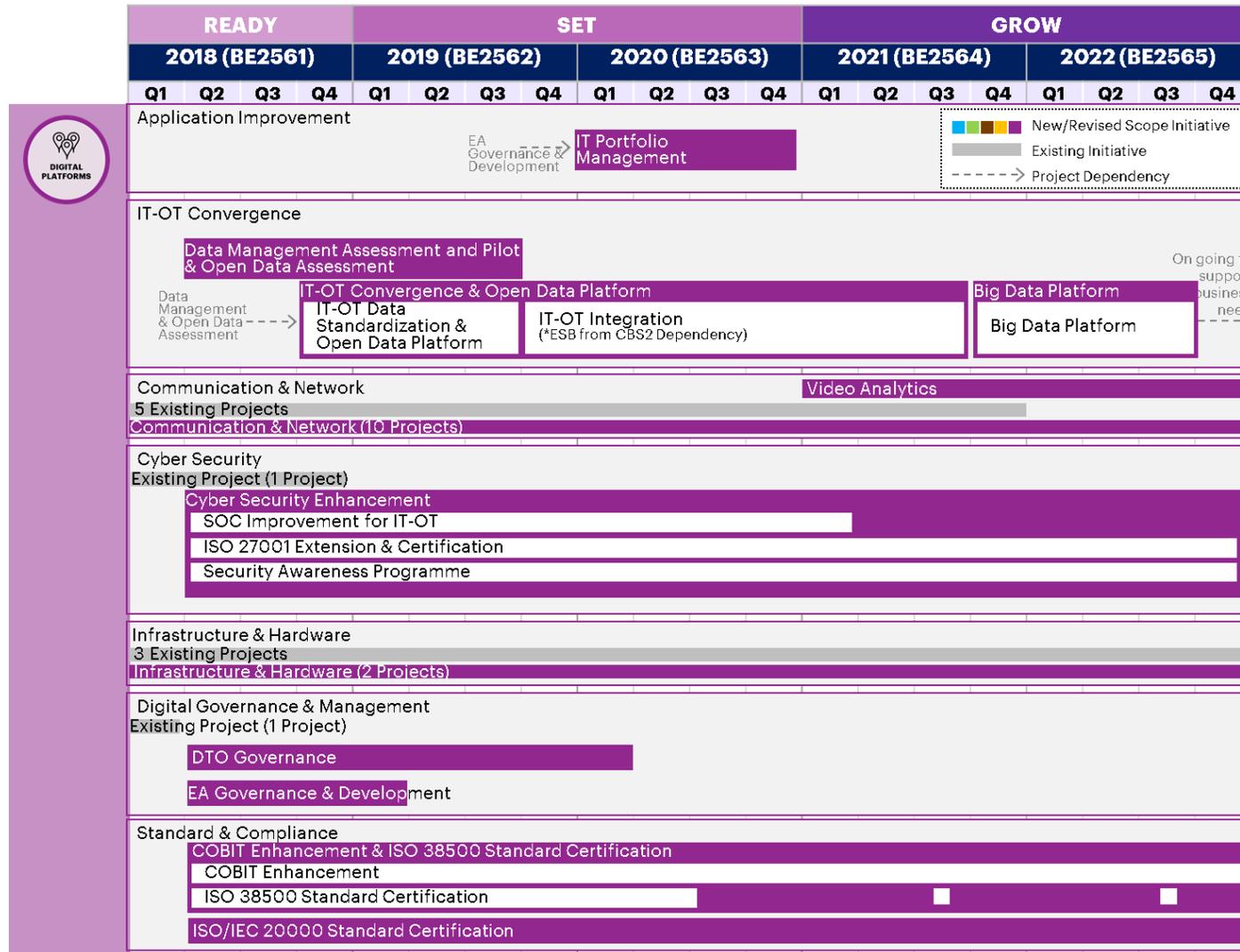


Figure 17 : Initiatives and Projects under Digital Platform

Initiative/Project		Owner	Phase					
			Ready	Set		Grow		
			2561	2562	2563	2561	2565	
No.	Digital Platform							
	PEA Digital Roadmap							
1	IT Portfolio	ICT	-	-	36.00	-	-	
2	Data Management Assessment and Pilot & Open Data Assessment	ICT	36.30	-	-	-	-	
3	IT-OT Convergence & Open Data Platform	ICT	53.47	63.28	-	-	-	
4	Big Data Platform	ICT	-	-	-	117.84	-	
5	Video Analytics	ICT	-	-	-	9.60	32.80	
6	Cyber Security Enhancement	ICT	10.44	107.26	5.00	15.00	5.00	
7	DTO Governance	ICT	32.40	32.40	-	-	-	
8	EA Governance & Development	ICT	36.00	-	-	-	-	
9	COBIT Enhancement & ISO 38500 Standard Certification	ICT	4.80	7.30	1.30	1.30	3.30	
10	ISO/IEC 20000 Standard Certification	ICT	-	20.00	-	-	-	



Initiative/Project		Owner	Phase				
			Ready	Set		Grow	
			2561	2562	2563	2561	2565
No.	Digital Platform						
11	Communication and Network	ICT	1,005.07 ¹	904.94	1,113.19	1,132.59	878.62
12	Infrastructure & Hardware	ICT	208.37 ²	80.47	165.83	167.67	168.51
	Other Plans	ICT					
1	Network Development for supporting Data Center	ICT	-	-	-	-	-
2	Integrated Network Management System (INMS)	ICT	-	-	-	-	-
3	Setup and link the communication systems between the Data Center and Disaster Recovery Center	ICT	-	257.22	-	-	-
4	Design and setup IP Core Phase 2	ICT	-	-	-	-	-
5	WAN Network Maintenance and Service	ICT	90.00 ³	90.00	-	-	-
6	Digital Radio Improvement	ICT	509.66	-	-	-	-
7	The development of security systems for information technology in accordance with international standard ISO/IEC 27001:2013	ICT	1.90	-	-	-	-
8	Data Center Construction of PEA Headquarter	ICT	-	-	-	-	-
9	IT Infrastructure Design and Consolidation for PEA (Link to DC Networking Development, INMS, DC/DR communication system)	ICT	-	926.93	-	-	-

Initiative/Project		Owner	Phase				
			Ready	Set		Grow	
			2561	2562	2563	2561	2565
No.	Digital Platform						
10	Disaster Recovery Center Development and Construction (Link to DC Networking Development, INMS, DC/DR communication system)	ICT	-	-	-	-	-
11	EA Tool Procurement	ICT	-	-	-	-	-
	Budget of PEA Digital Roadmap 2018-2022		1,398.02	1,204.49	1,321.32	1,444.00	1,088.24
	Budget of other plans		601.56	1,274.14	-	-	-

Remark ¹ Approved budget in 2561 accounting to 1,005.07 million Thai Baht
² Approved budget in 2561 accounting to 208.37 million Thai Baht
³ Approved budget in 2561 accounting to 90.00 million Thai Baht
 Dark grey area shows initiatives/projects period -

6. Summary of Budgetary Breakdown by Digital Strategy

Budgetary Breakdown by Digital Strategy		READY	SET			GROW		TOTAL
		2018	2019	2020	2021	2022	(THB)	
	Digital Energy Operations	3,606,625,000.00	9,616,928,000.00	205,570,000.00	1,418,400,000.00	378,930,000.00	15,226,453,000.00	
	Budget of PEA Digital Roadmap 2018 - 2022	26,625,000.00	161,975,000.00	205,570,000.00	78,400,000.00	378,930,000.00	851,500,000.00	
	- Request by IT function	-	-	-	-	-	-	
	- Request by other functions	26,625,000.00	161,975,000.00	205,570,000.00	78,400,000.00	378,930,000.00	851,500,000.00	
	Budget of other plans	3,580,000,000.00	9,454,953,000.00	-	1,340,000,000.00	-	14,374,953,000.00	
	- Request by IT function	-	-	-	-	-	-	
	- Request by other functions	3,580,000,000.00	9,454,953,000.00	-	1,340,000,000.00	-	14,374,953,000.00	
	Connected Customer	109,710,000.00	214,360,000.00	65,880,000.00	433,511,300.00	16,200,000.00	839,661,300.00	
	Budget of PEA Digital Roadmap 2018 - 2022	60,030,000.00	138,900,000.00	16,200,000.00	421,091,300.00	16,200,000.00	652,421,300.00	
	- Request by IT function	5,400,000.00	34,600,000.00	-	299,852,300.00	-	339,852,300.00	
	- Request by other functions	54,630,000.00	104,300,000.00	16,200,000.00	121,239,000.00	16,200,000.00	312,569,000.00	
	Budget of other plans	49,680,000.00	75,460,000.00	49,680,000.00	12,420,000.00	-	187,240,000.00	
	- Request by IT function	49,680,000.00	49,680,000.00	49,680,000.00	12,420,000.00	-	161,460,000.00	
	- Request by other functions	-	25,780,000.00	-	-	-	25,780,000.00	
	Next Generation Enterprise	3,738,560,000.00	42,300,000.00	379,900,000.00	14,400,000.00	9,900,000.00	4,185,060,000.00	
	Budget of PEA Digital Roadmap 2018 - 2022	139,100,000.00	42,300,000.00	379,900,000.00	14,400,000.00	9,900,000.00	585,600,000.00	
	- Request by IT function	139,100,000.00	9,900,000.00	379,900,000.00	14,400,000.00	9,900,000.00	553,200,000.00	
	- Request by other functions	-	32,400,000.00	-	-	-	32,400,000.00	
	Budget of other plans	3,599,460,000.00	-	-	-	-	3,599,460,000.00	
	- Request by IT function	3,599,460,000.00	-	-	-	-	3,599,460,000.00	
	- Request by other functions	-	-	-	-	-	-	
	Workforce of the Future	75,846,000.00	296,409,000.00	74,315,000.00	56,715,000.00	1,315,000.00	504,600,000.00	
	Budget of PEA Digital Roadmap 2018 - 2022	75,846,000.00	296,409,000.00	74,315,000.00	56,715,000.00	1,315,000.00	504,600,000.00	
	- Request by IT function	-	-	-	-	-	-	
	- Request by other functions	75,846,000.00	296,409,000.00	74,315,000.00	56,715,000.00	1,315,000.00	504,600,000.00	
	Budget of other plans	-	-	-	-	-	-	
	- Request by IT function	-	-	-	-	-	-	
	- Request by other functions	-	-	-	-	-	-	
	Digital Platform	1,988,418,872.00	2,489,792,686.00	1,321,318,760.00	1,443,995,310.00	1,088,236,746.00	8,331,762,374.00	
	Budget of PEA Digital Roadmap 2018 - 2022	1,386,858,872.00	1,215,650,286.00	1,321,318,760.00	1,443,995,310.00	1,088,236,746.00	6,456,059,974.00	
	- Request by IT function	1,386,858,872.00	1,215,650,286.00	1,321,318,760.00	1,443,995,310.00	1,088,236,746.00	6,456,059,974.00	
	- Request by other functions	-	-	-	-	-	-	
	Budget of other plans	601,560,000.00	1,274,142,400.00	-	-	-	1,875,702,400.00	
	- Request by IT function	601,560,000.00	1,274,142,400.00	-	-	-	1,875,702,400.00	
	- Request by other functions	-	-	-	-	-	-	
	Total Budget	9,519,159,872.00	12,659,789,686.00	2,046,983,760.00	3,367,021,610.00	1,494,581,746.00	29,087,536,674.00	
	Budget of PEA Digital Roadmap 2018 - 2022	1,688,459,872.00	1,855,234,286.00	1,997,303,760.00	2,014,601,610.00	1,494,581,746.00	9,050,181,274.00	
	Budget of other plans	7,830,700,000.00	10,804,555,400.00	49,680,000.00	1,352,420,000.00	-	20,037,355,400.00	

7. Summary of Budgetary Breakdown by Types of Budget

Budgetary Breakdown by Types of Budget	READY	SET			GROW		TOTAL
	2018	2019	2020	2021	2022	(THB)	
Total Budget	9,519,159,872.00	12,659,789,686.00	2,046,983,760.00	3,367,021,610.00	1,494,581,746.00	29,087,536,674.00	
Budget of PEA Digital Roadmap 2018 - 2022	1,688,459,872.00	1,855,234,286.00	1,997,303,760.00	2,014,601,610.00	1,494,581,746.00	9,050,181,274.00	
- Request by IT function	1,531,358,872.00	1,260,150,286.00	1,701,218,760.00	1,758,247,610.00	1,098,136,746.00	7,349,112,274.00	
Operating Budget	268,040,000.00	215,700,000.00	240,300,000.00	326,300,000.00	283,200,000.00	1,333,540,000.00	
Approved	132,800,000.00	-	-	-	-	132,800,000.00	
Pending for Approval	135,240,000.00	215,700,000.00	240,300,000.00	326,300,000.00	283,200,000.00	1,200,740,000.00	
Investment Budget	1,263,318,872.00	1,044,450,286.00	1,460,918,760.00	1,431,947,610.00	814,936,746.00	6,015,572,274.00	
Approved	1,080,648,872.00	-	-	-	-	1,080,648,872.00	
Pending for Approval	182,670,000.00	1,044,450,286.00	1,460,918,760.00	1,431,947,610.00	814,936,746.00	4,934,923,402.00	
- Request by other functions	157,101,000.00	595,084,000.00	296,085,000.00	256,354,000.00	396,445,000.00	1,701,069,000.00	
Operating Budget	63,846,000.00	92,209,000.00	79,315,000.00	50,715,000.00	39,115,000.00	325,200,000.00	
Approved	-	-	-	-	-	-	
Pending for Approval	63,846,000.00	92,209,000.00	79,315,000.00	50,715,000.00	39,115,000.00	325,200,000.00	
Investment Budget	93,255,000.00	502,875,000.00	216,770,000.00	205,639,000.00	357,330,000.00	1,375,869,000.00	
Approved	-	-	-	-	-	-	
Pending for Approval	93,255,000.00	502,875,000.00	216,770,000.00	205,639,000.00	357,330,000.00	1,375,869,000.00	
Budget of other plans	7,830,700,000.00	10,804,555,400.00	49,680,000.00	1,352,420,000.00	-	20,037,355,400.00	
- Request by IT function	4,250,700,000.00	1,323,822,400.00	49,680,000.00	12,420,000.00	-	5,636,622,400.00	
- Request by other functions	3,580,000,000.00	9,480,733,000.00	-	1,340,000,000.00	-	14,400,733,000.00	

8. Summary of Budgetary Breakdown by Status of Budget

Budgetary Breakdown by Status of Budget	READY	SET			GROW		TOTAL
	2018	2019	2020	2021	2022	(THB)	
Total Budget	9,519,159,872.00	12,659,789,686.00	2,046,983,760.00	3,367,021,610.00	1,494,581,746.00	29,087,536,674.00	
Budget of PEA Digital Roadmap 2018 - 2022	1,688,459,872.00	1,855,234,286.00	1,997,303,760.00	2,014,601,610.00	1,494,581,746.00	9,050,181,274.00	
Approved Budget	1,213,448,872.00	-	-	-	-	1,213,448,872.00	
- Operating Budget	132,800,000.00	-	-	-	-	132,800,000.00	
- Investment Budget	1,080,648,872.00	-	-	-	-	1,080,648,872.00	
Pending for Approval	475,011,000.00	1,855,234,286.00	1,997,303,760.00	2,014,601,610.00	1,494,581,746.00	7,836,732,402.00	
- Operating Budget	199,086,000.00	307,909,000.00	319,615,000.00	377,015,000.00	322,315,000.00	1,525,940,000.00	
- Investment Budget	275,925,000.00	1,547,325,286.00	1,677,688,760.00	1,637,586,610.00	1,172,266,746.00	6,310,792,402.00	
Budget of other plans	7,830,700,000.00	10,804,555,400.00	49,680,000.00	1,352,420,000.00	-	20,037,355,400.00	

5. Owner and Supporting Function

Owner and supporting function of PEA Digital Roadmap and other PEA plans can be summarize as follows:


 หน่วยงานที่รับผิดชอบ (Owner)
 
 หน่วยงานที่เกี่ยวข้อง (Supporting)
 
 หน่วยงานที่ไม่เกี่ยวข้อง

Strategy	Initiative/Project	CS	ENG	CPM	OM	R1	R2	R3	R4	CS	ICT	AF	GS	CSR	HR	OOG	LGO	IAB
Digital Energy Operations	Digital Worker/Mobile Workforce for Design & Surveys	S	S	O	S	S	S	S	S		S							
	Maintenance Automation	S			O	S	S	S	S		S							
	Grid Impact Assessment & Grid Code Revision	O			S						S							
	Grid Analytics	S			O	S	S	S	S		S							
	SMOC Governance and Operation Setup	S			O	S	S	S	S		S							

Strategy	Initiative/Project	CS	ENG	CPM	OM	R1	R2	R3	R4	CS	ICT	AF	GS	CSR	HR	OOG	LGO	IAB
	Capital Project Management	S	S	○							S							
	SCADA Phase 3 (TDMS for SW/HW)				○						S							
	GIS Phase 3	○									S							
	GIS Enhancement for Asset Management & Smart Grid & As a Services	○									S							
	Enterprise Asset Management		S		○						S		S					
	AMI for C&I 86,000 Units				○						S							
	Smart Grid Pilot Pattaya	○						S			S							
	Micro Grid Mae Sarieng & Roll-out	○				S					S							
	Smart Grid Development Phase 1	○									S							

Strategy	Initiative/Project	CS	ENG	CPM	OM	R1	R2	R3	R4	CS	ICT	AF	GS	CSR	HR	OOG	LGO	IAB
Connected Customer	Customer Experience Design					○	○	○	○		S							
	Call Center Enhancement (Phase 4)					S	S	S	S		○							
	Customer Analytics for Insights & Personalization					○	○	○	○		S							
	Customer Relationship Management (CRM)					○	○	○	○		S							
	Non-Voice Service: Chatbot					S	S	S	S		○							
	PEA Customer Channel Performance Management					○	○	○	○		S							
	Call Center Phase 3										○							
	PEA Smart Plus							○			S							
	e-Tax Invoice/ e-Receipt										S	○						

Strategy	Initiative/Project	CS	ENG	CPM	OM	R1	R2	R3	R4	CS	ICT	AF	GS	CSR	HR	OOG	LGO	IAB
Next Generation Enterprise	Enterprise Performance Management (EPM)	S	S	S	S	S	S	S	S	S	O	S	S	S	S	S	S	S
	Prime Value Chain Analysis	S	S	S	S	S	S	S	S	O	S	S	S	S	S	S	S	S
	Enterprise Content Management (ECM)	S	S	S	S	S	S	S	S	S	O	S	S	S	S	S	S	S
	Digital Strategy Refresh	S	S	S	S	S	S	S	S	S	O	S	S	S	S	S	S	S
	CBS Phase 2	S	S	S	S	S	S	S	S	S	O	S	S	S	S			
	Modern Warehouse Pilot Roll-out											S		O				
	Sustainable Support System											S			O			
	Electronic Document System											O						

Strategy	Initiative/Project	CS	ENG	CPM	OM	R1	R2	R3	R4	CS	ICT	AF	GS	CSR	HR	OOG	LGO	IAB
Workforce of the Future	Human Capital Strategy	S	S	S	S	S	S	S	S	S	S	S	S	S	O	S	S	S
	Employee Collaboration & Recognition	S	S	S	S	S	S	S	S	S	S	S	S	S	O	S	S	S
	Workforce Development & Measurement	S	S	S	S	S	S	S	S	S	S	S	S	S	O	S	S	S
	Innovation Center of Excellence	O										S			S			
	Workforce Planning & Sourcing	S	S	S	S	S	S	S	S	S	S	S	S	S	O	S	S	S
	AI/ Chatbot for HR supports											S			O			
	HR Analytics										S			O				

Strategy	Initiative/Project	CS	ENG	CPM	OM	R1	R2	R3	R4	CS	ICT	AF	GS	CSR	HR	OOG	LGO	IAB
Digital Platform	IT Portfolio Management										O							
	Data Management Assessment and Pilot & Open Data Assessment									S	O							
	IT-OT Convergence & Open Data Platform	S			S	S	S	S	S		O							
	Big Data Platform	S			S	S	S	S	S		O							
	Video Analytics										O							
	Cyber Security Enhancement	S			S	S	S	S	S		O							
	DTO Governance	S	S	S	S	S	S	S	S	S	O	S	S	S	S	S	S	S
	EA Governance & Development											O						
	COBIT Enhancement & ISO 38500 Standard Certification											O						
	ISO/IEC 20000 Standard Certification											O						

Strategy	Initiative/Project	CS	ENG	CPM	OM	R1	R2	R3	R4	CS	ICT	AF	GS	CSR	HR	OOG	LGO	IAB
	Communication and Network										○							
	Infrastructure & Hardware										○							
	Network Development for supporting Data Center										○							
	Integrated Network Management System (INMS)										○							
	Setup and link the communication systems between the Data Center and Disaster Recovery Center											○						
	Design and setup IP Core Phase 2											○						
	WAN Network Maintenance and Service											○						
	Digital Radio Improvement											○						
	The development of security systems for information technology in accordance with international standard ISO/IEC 27001:2013											○						
	Data Center Construction of PEA Headquarter											○						
	IT Infrastructure Design and Consolidation for PEA (Link to DC Networking Development, INMS, DC/DR communication system)											○						
	Disaster Recovery Center Development and Construction (Link to DC Networking Development, INMS, DC/DR communication system)											○						
	EA Tool Procurement											○						

6. Opportunity for PEA New Business Streams

Digital transformation will not only deliver operational excellence (**current value creation**) at the beginning of PEA’s transformation journey but also lay the foundation of the innovation growth engine (**future value creation**).



Figure 18: Value Creation from Digital Transformation

Initiatives and projects of PEA Digital Roadmap are mainly focusing on delivering operational excellence (current value). PEA’s New Business to increase its Future Value will come after it has strong fundamental of innovative workforce and excellence operation. There are three categories of New Business³ based on leading practices as follow:

1. **Business-to-Customer (B2C) Products & Services** - Offerings developed for residential consumers and often also applicable to small and medium businesses
2. **Business-to-Business (B2B) Products & Services** - Products and services aimed at large business customers and commercial industrial
3. **Business Services** - Services provided to other businesses leveraging existing capabilities or digital platforms that create an ecosystem or marketplace

However, not all New Business are succeeding as they are still emrging; therefore, PEA need to make a deep research before deciding to set up New Business.

Customer Category	Service	Business Status
B2C Products & Services	Home Warranty & Maintenance Services	Largely Successful
	Energy Efficiency Consultation	Largely Successful
	Renewable Energy & Storage	Still Emerging
	Connected Home Services	Still Emerging
	Electric Vehicle Charging Services	Still Emerging

³ Accenture Research – Digital Utility 2017



Customer Category	Service	Business Status
	Telecommunications, TV, Internet	Limited Success
	Appliances & Other Home Devices	Limited Success
	Financial Services & Insurance	Limited Success
B2B Products & Services	Energy Efficiency Consultation	Largely Successful
	Engineering, Energy Infrastructure & Construction Consultation	Largely Successful
	Rebates & Financing	Largely Successful
	Demand Management Solutions	Largely Successful
	Renewable Energy & Storage	Still Emerging
	Building Energy Management	Still Emerging
	Electric Vehicle Fleet Services	Still Emerging
	Appliances & Equipment Sales	Limited Success
Business Services	Customer Operations Services	Largely Successful
	IT Operations Services	Largely Successful
	Engineering / Network Services	Largely Successful
	Metering Services	Largely Successful
	Renewables Integration Services	Still Emerging
	DR Platform/Aggregator	Still Emerging
	Connected Home or Building Energy Management Platform	Still Emerging
	Usage Analytics & Insight Platform	Still Emerging
	EV Charging Services Platform	Still Emerging

PEA Current business portfolio that are in different stage from ideas, planned pipeline, and currently commercialation in the market as follows:



No.	Current Portfolio Innovation	Description of Service	Business Status	Owner
1	Smart Home (HIVE Application)	Research and develop a platform for home energy management (HEMS), which is currently under the development with the target customers (real estate developers)	Business Development	CS
2	Ev Charging Station	Provide vehicle charging stations with quick charge technology along the major tourism routes, with planned application as a common platform for charging station information and availability	Piloted	PSD
3	Energy Efficiency (ESCO, LED Products)	Procure LED bulbs and market in PEA shops, shopping malls, and home center	Commercialized	PEA ENCOM
4	Energy Management Service Provider in Form Of ESCO/ ESCO Facilitator	Provide a broad range of energy solutions including analyzing the property, designing an energy efficient solution, installing the required elements, maintaining the system and validating energy saving	Commercialized	PEA ENCOM, PSD
5	Engineering Service	Engineering Service Contractor	Commercialized	PEA
		Engineering Service Provider	Commercialized	PEA
6	Solar Rooftop	Lead generation and sales, engineering design and project development, rooftop installation and interconnection to grid, and maintenance	Commercialized	PSD, CS, R1-R4, PEA ENCOM
7	Renewable Energy Investment	Invest and co invest in renewable energy business both in domestic and abroad	Commercialized	PEA ENCOM
8	Electrical Safety Equipments	Develop and commercial safety equipment related to grid, and	Commercialized	R1-R4



No.	Current Portfolio Innovation	Description of Service	Business Status	Owner
		electrical safety gears, and equipment to improve distribution system integrity		
9	Engineering Innovations (For Grid Improvement)	Conduct, research and develop power distribution-related solutions, and plan to market and sell to the customers	Research & Development	PSD
10	Training Service	Subcontract training about electrical systems, energy conservation management etc.	Commercialized	PEA ENCOM
11	Microgrid	Micro Grid Development at Mae Sariang (1 system). Improvement of Micro Grid System in accordance with EGAT's Smart Grid Project at Amphoe Muang, Mae Hong Son. Installation of Micro Grid System in 3 Southern Border Provinces and 4 Amphoe in Songkhla and install microgrid systems in the island area, type: Off Grid (1 system)	Piloted	PSD
12	Solar Application (Solar Monkey, Solar Hero)	Integrated platform for consumers to quantify costs and benefits of installing PV rooftop, and for EPC and banks interaction with consumer for installation solutions	Research & Development	PSD



7. Benefits of PEA Digital Roadmap

Benefits of PEA Digital Roadmap to stakeholders are as follows.

Public Sector

- Improving State Enterprises performance to be faster, more convenient and more transparent
- Improving accessibility to reliable and updated data, connecting and encouraging more energy information sharing between government agencies
- Improving digital skills and capabilities of government officers and related government agencies
- Building stable and secure infrastructure in Smart grid and Digital Platform

PEA Enterprise / PEA People

- Increasing efficiency in working, energy network system management planning and services by implementing technology into the processes together with building in-depth data analysis capability
- Connecting and strengthening cooperation between functions
- Building a culture of innovation and new sources of income for PEA in the future
- Improving the quality of PEA people's life by implementing technology in working process that will increase efficiency, productivity and security

Partners

- Improving business process with partners to be more transparent and faster by effective content management

Customers / Users

- Improving stability of energy distribution system by implementing technology into management
- Increasing service channels and Improving customers service by implementing technology into process
- Building excellent customers experience with PEA which leading to earning customers trust and good brand image



Community / Society and Environment

- Improving accessibility to energy information and supporting government policy in encouraging people and community in electricity usage management

Improving the quality of people's life with better accessibility to information from State-Enterprises

8. Key Success Factors

These are 5 key success factors to achieve PEA Digital Roadmap goals.

1. Leadership

To develop PEA digital Roadmap is a big transformation of the organization. Since, changes are required in every departments. Therefore, it is important that leaders have clear ambition and passion for digital across all levels and effective decision making.

2. Operating Model

To become a digital utility, it's not a job for only one person or department. But, every departments should be able to change and move forward together. Therefore, it is necessary to have a clear operating model of how digital capabilities are organized across the organization to drive speed, agility and synergy.

3. Partnership

To achieve PEA Digital Roadmap goals, PEA should define ecosystem of partners to rapidly achieve the ambition.

4. Culture

To transform PEA into a digital utility, PEA people in all levels are affected and involved since technologies will be implemented into working process and operation. Therefore, it is important that PEA people have digital mindset and new ways of working at all levels of the organization.

5. Capability

To achieve PEA Digital Roadmap goals, it is important to build new capability to enable core and disruptive business models that exploit new sources of value.

However, these 5 key success factors can be deployed by initiating PEA Digital Transformation Program Management or DTO / Digital Governance, and Change Management and Training which aim to drive, track performance, integrate plans and reduce resistance to long-term change within the organization.

Remark: In PEA Digital Roadmap, Building Digital Governance is a part of “DTO Governance” initiative. (Please see the appendix for more detail)

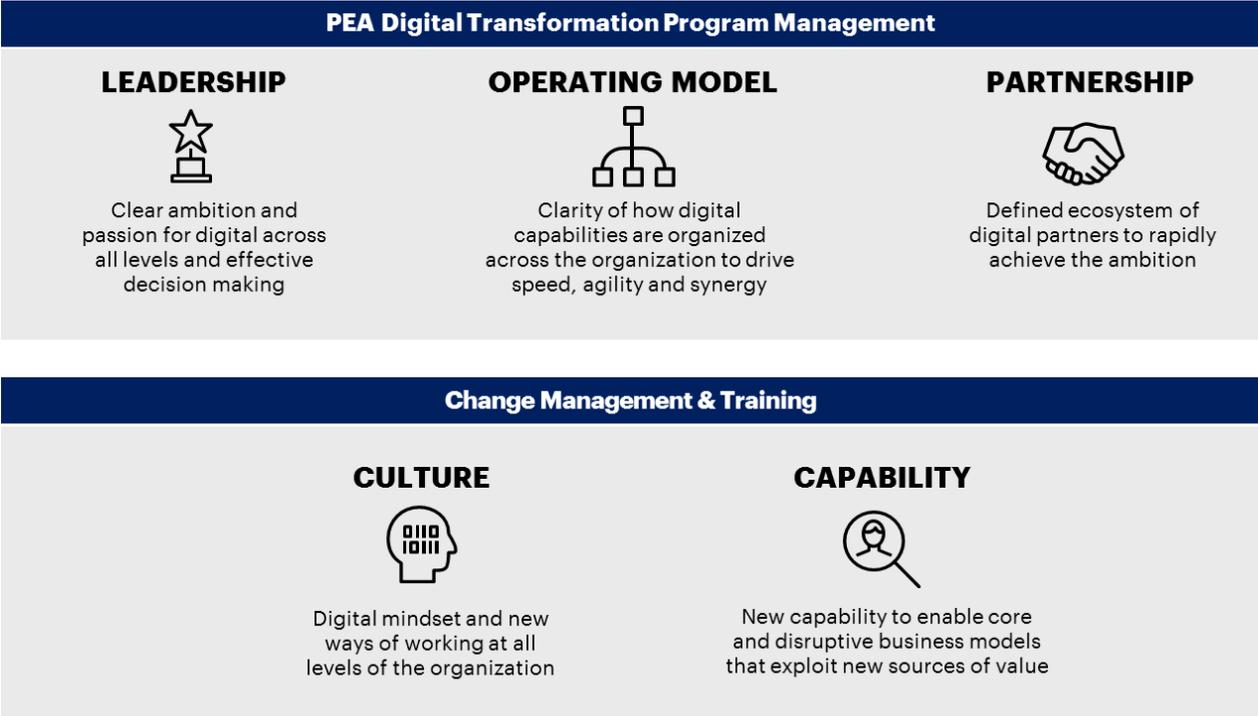


Figure 19: Achieving goals by Digital Program Management and Change Management

Digital Program Management and Change Management can be deployed through DTO Structure or Digital Governance. Below is recommended Future PEA Digital Governance.

Recommended Future PEA Digital Governance

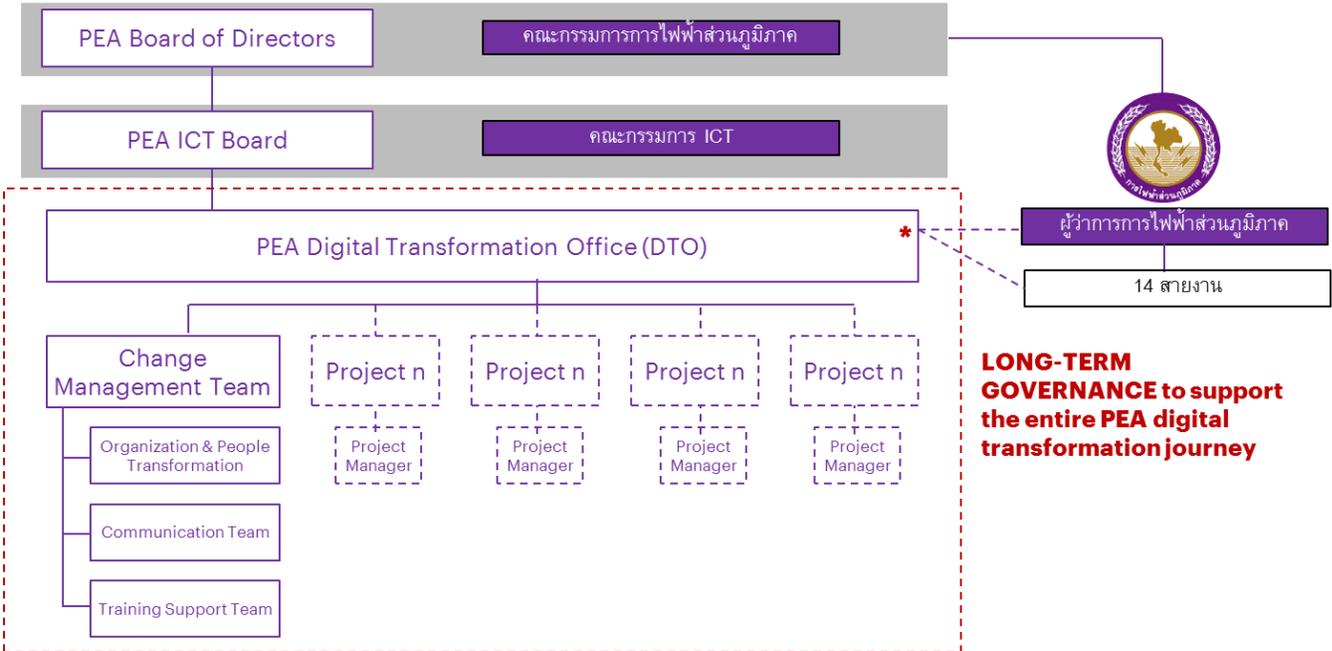


Figure 20: Example of Future PEA Digital Governance

9. Appendix

Details of each plan are broken down by strategy and can be summarized as the following tables.

1. Digital Energy Operation

	Initiative/Project	Description	Referred to the original plan.
No.	Digital Energy Operations		
	Digital Master Plan 2561 - 2565		
1	Digital Worker/Mobile Workforce for Design & Surveys	<p>Digital Worker/Mobile Workforce for Design & Surveys is a project to improve working process by implementing technology into process. Therefore, staffs can work efficiently from anywhere and anytime in terms of design&surveys and construction process forecasting.</p> <p>Objectives:</p> <ul style="list-style-type: none"> (1) To monitor and manage design&surveys process day-and-night. (2) To improve working process by implementing Connected Workforce technology. (3) To manage all engineering related documents and connect to other work functions. 	
2	Maintenance Automation	<p>It is a project to enhance working process with Maintenance Automation by using technology to increase work efficiency and security for staffs</p> <p>Objectives:</p> <ul style="list-style-type: none"> (1) To increase efficiency in inspection and maintenance. 	

Initiative/Project		Description	Referred to the original plan.
No.	Digital Energy Operations		
		(2) To increase workplace safety and staff satisfaction. (3) To effectively conduct power outage maintenance.	
3	Grid Impact Assessment & Grid Code Revision	It is a project to assess grid emerging technologies impact on grid such as EV Charging Station and Solar Rooftop installment in industrial and domestic sector. The scope of project is also to revise Grid code in order to set operation standards and practical guidelines for dealing with impact from grid emerging technologies.	
4	Grid Analytics	Grid Analytics is a project to develop PEA's grid analytics capability by using data from AMI/AMR of PEA main consumers and smart grid. Moreover, the project also aims to further analyze and utilize data in decision making process and increasing work efficiency. Objectives: (1) To analyze data and forecast electricity demand in short and long term, seasonal and various consumption sectors. (2) To utilize analyzed data in conducting power outage maintenance and defining causes of power outage.	
5	SMOC Governance and Operation Set Up	It is a project to set up Smart Meter Operation Center (SMOC) to support smart grid operation and communication for unified and efficient work process Objectives: (1) To effectively manage smart meter and support the extension of Smart grid and Micro Grid projects in the future.	

Initiative/Project		Description	Referred to the original plan.
No.	Digital Energy Operations		
	The original plan		
1	Capital Project Management	Development of large project management support tools. Construction and Project Management Function has initially developed an application to report on the site through the website. The project manager can use project information to support decision making. In addition, Construction and Project Management Function has set up a large project management approach to align with the scope of the CBS Phase 2 project.	<ul style="list-style-type: none"> • Project by Construction and Project Management Function. • Scope of work for CBS Phase 2
2	SCADA Phase 3 (TDMS for SW/HW)	<p>The objective is; to optimize the power center system.</p> <p>The scope of work is as follows.</p> <ol style="list-style-type: none"> (1) To improve hardware and software performance within the center building. (2) To setup FRTU and MARS Remote (9,940 units) (3) To setup MARS Master Radio (200 units) (4) To setup CCTV at the unmanned power station (400 units) (5) To renovate power station to align with IEC61850 (20 stations) (6) To setup a communication and network control center (1 center) (7) To setup Fiber Optic 1,900 km. 	<ul style="list-style-type: none"> • The Eleventh National Economic and Social Development 2555 – 2559 • DDIP plan 2017

Initiative/Project		Description	Referred to the original plan.
No.	Digital Energy Operations		
3	GIS Phase 3	<p>It's the original plan from master plan. To enhance the capabilities of GIS, by focusing on connecting data and services with government agencies and the core systems of the PEA. To support the use of engineers and technicians. To add wireless services to the field. To develop main equipment management in power systems included protection and transformer and to connect to AMR. To expand self service for customers through CRM Call Agent and AMR and to use map data to support the logistics system of the PEA.</p> <p>Objectives:</p> <p>(1) To develop the geographic information system of the power system to be comprehensive and can be used together.</p> <p>(2) To contribute enough tools and optimize the application to support the system.</p> <p>(3) To develop system to manage resource usage, the stability and security of the system and it can support high availability.</p> <p>(4) To create a suitable database structure to support the connection of geographic information system to the core systems of the PEA.</p> <p>(5) To provide geographic information system to support the development of smart grid system of PEA.</p> <p>(6) To develop geographic information system and can be used for analysis reports and summary reports, then the executive can use these kinds of reports for decision making about policy.</p>	<ul style="list-style-type: none"> • The Eleventh National Economic and Social Development 2555 – 2559

Initiative/Project		Description	Referred to the original plan.
No.	Digital Energy Operations		
4	GIS Enhancement for Asset Management & Smart Grid & As a Services	<p>It extends the scope of application of geographic information technology in management. and the performance of various aspects according to the PEA's strategy.</p> <p>The scope of work is as follows.</p> <p>(1) Asset management system</p> <p>(2) Management system for underground power distribution system and submarine cable system.</p> <p>(3) Management of land and buildings of PEA.</p> <p>(4) Management of fiber optic network management.</p> <p>(5) Improvement of geographic database to support smart grid.</p> <p>(6) Smart Service for customers.</p> <p>(7) Development of Map service for basic electricity distribution system.</p> <p>(8) Improvement of the efficiency and capability of GIS computer systems and procurement of additional software licenses.</p>	<ul style="list-style-type: none"> • The Twelfth National Economic and Social Development 2560-2564
5	Enterprise Asset Management	<p>The objective of enterprise asset management is; to develop and manage PEA's asset management system efficiently in the headquarter and office areas.</p> <p>In addition, to achieve the goals of the PEA's Strategic Plan for enterprise asset management by implementing ISO 55000 for critical assets and to certify ISO 55000 standard certification within 2565</p>	<ul style="list-style-type: none"> • The Twelfth National Economic and Social Development 2560-2564 • PEA Strategic Plan for Asset

Initiative/Project		Description	Referred to the original plan.
No.	Digital Energy Operations		
			<ul style="list-style-type: none"> Management of Electric Power System • Scope of work for CBS Phase 2
6	AMI for C&I 86,000 Units	<p>Smart Metering System Installation for Large Power Users.</p> <p>The objective of this project is; to expand and install the smart meter for large power users to cover the country.</p> <p>The scope of work is as follows.</p> <ul style="list-style-type: none"> (1) Setup Smart Metering System, Type: TOU (86,000 units) (2) Setup communication equipment and accessories (86,000 units) (3) Setup computer system (1 system) 	<ul style="list-style-type: none"> • The Twelfth National Economic and Social Development 2560-2564 • ICT Master Plan Phase 3 2556-2560
7	Smart Grid Pilot Pattaya	<p>Smart Grid Pilot at Pattaya, Chonburi. It is a pilot project of PEA's Smart Grid Plan.</p> <p>It covers the provision and installation of smart meters in pilot areas included smart meter management in the pilot area.</p>	<ul style="list-style-type: none"> • The Eleventh National Economic and Social Development 2555 – 2559 • Smart Grid Master Plan

Initiative/Project		Description	Referred to the original plan.
No.	Digital Energy Operations		
8	Micro Grid Mae Sarieng & Roll-out	<p>This project covers two projects:</p> <p>(1) Micro Grid at Mae Sariang, Mae Hong Son.</p> <p>The scope of work covered: setup energy storage system (2 systems) and setup Micro Grid Controller (1 system)</p> <p>(2) Micro Grid Phase 1</p> <p>The objective of Micro Grid Phase 1: To expand and develop the micro grid system in remote areas. The scope of work covered: Micro Grid Development at Mae Sariang (1 system). Improvement of Micro Grid System in accordance with EGAT's Smart Grid Project at Amphoe Muang, Mae Hong Son. Installation of Micro Grid System in 3 Southern Border Provinces and 4 Amphoe in Songkhla and install microgrid systems in the island area, type: Off Grid (1 system)</p>	<ul style="list-style-type: none"> • The Eleventh National Economic and Social Development 2555 – 2559 • The Twelfth National Economic and Social Development 2560-2564 • Smart Grid Master Plan

Initiative/Project		Description	Referred to the original plan.
No.	Digital Energy Operations		
9	Smart Grid Development Phase 1	<p>The objectives of Smart Grid Development Phase 1 are to expand the results and develop intelligent infrastructure (Smart Grid). The area covered by the municipality and according to the Smart City Plan of the government sector in 4 regions and the source area is small manufacturers (VSPP).</p> <p>The scope of work is as follows.</p> <ol style="list-style-type: none"> (1) To setup 739,000 intelligent meters. (2) To setup communication system: Last mile / Back haul (4 systems) (3) To setup metering system (1 system) (4) To setup meter data management system (1 system) (5) To setup network management system (1 system) (6) To setup information link system (1 system) (7) To setup HEMS/BEMS/direct load control system (4 systems) (8) To setup demand respond management sytem (1 system) (9) To build 8 Intelligent power stations (10) To setup remote control unit. Type: Fast Switching (56 units) (11) To setup power management system for small power producers (1 system) 	<ul style="list-style-type: none"> • The Twelfth National Economic and Social Development 2560-2564

2. Connected Customer

Initiative/Project		Description	Referred to the original plan.
No.	Connected Customer		
	Digital Master Plan 2561 - 2565		
1	Customer Experience Design	<p>It's the customer experience design to ensure that all chanel have been relevant and service to customers with the same experience for both contact by online and offline such as access to PEA office services, PEA shop, SMS, e-mail, Mobile App and Social Media. To make the service as smooth as possible and enhance corporate image.</p> <p>(1) To integrate PEA's customer communication channel, customers are provided seamless service.</p> <p>(2) To meet the expectations of customers by facilitating customers to receive efficient services.</p>	
2	PEA Customer Channel Performance Management	<p>It is the performance evaluation of PEA Customer Channels such as PEA Office, PEA Shop, and PEA Mobile Shop. To setup the system is the same throughout the country.</p> <p>Objectives:</p> <p>(1) To make the decision to manage the maintenance of resources and use data in the next order of analysis.</p>	

Initiative/Project		Description	Referred to the original plan.
No.	Connected Customer		
3	Customer Analytics for Insights & Personalization	<p>Creating an in-depth analysis process in the corner of customer demand, electricity consumption, customer interaction channel, social media, and other factors that affect the customer's electricity consumption. To meet the needs of customers through various communication channels and to further analyze customer data at an individual level.</p> <p>Objectives:</p> <p>(1) To develop a project or program or suggestion to meet the needs of customers on an individual level through a Website or Mobile Application.</p>	
4	Non-Voice Service: Chatbot	<p>It's an automatic response system to answer the questions to users via website or application when users or customers have any problems or questions. It's fast, effective and no time limit. To encourage good corporate image and impress the customers.</p> <p>Objectives:</p> <ul style="list-style-type: none"> (1) Ability to respond quickly. (2) Promote the Digital Image to the leadership of Digital Utility (3) Improve the work performance of personnel. 	

Initiative/Project		Description	Referred to the original plan.
No.	Connected Customer		
5	Customer Relationship Management (CRM)	<p>The process of customer relationship management has helped to strengthen and enhance the interaction among PEA's customers by analyzing the contact history and channels of interaction with customers and take the analysis results to improve and develop good relationships with customers.</p> <p>Objectives:</p> <ul style="list-style-type: none"> (1) To effectively interact with customers and support the work of PEA staff. (2) To support the process, sales management, marketing plan and analysis of market data. 	
6	Call Center Enhancement (Phase 4)	<p>It's a continuous project of PEA Call Center Phase 3 (outsource). This project will be PEA Call Center Phase 4 (outsource).</p> <p>Objectives:</p> <ul style="list-style-type: none"> (1) To analyze the reports from the PEA Call Center. (2) To integrate customer data from source and other channels for in-depth customer data analysis. 	

Initiative/Project		Description	Referred to the original plan.
No.	Connected Customer		
	The original plan		
1	Call Center Phase 3	<p>It's a continuous project of PEA Call Center Phase 2 (outsource). This project will be PEA Call Center Phase 3 (outsource) to evaluate the outsource service and development.</p> <p>(1) To increase the efficiency of public services by adding services, including the ability to contact the call center.</p> <p>(2) To save the cost of traveling in contact with the Provincial Electricity Authority.</p> <p>(3) To expand the capacity of the Provincial Electricity Authority in terms of quantity and quality.</p> <p>(4) To expand the capabilities of the connection to PEA's relevant system.</p> <p>(5) To ensure that the Provincial Electricity Authority has effective and clear monitoring system. Management can view reports in various ways and can monitor the performance of the organization.</p>	<ul style="list-style-type: none"> • ICT Master Plan Phase 3 2556-2560
2	PEA Smart Plus	<p>Application Development for customers. To create convenience, speed and satisfaction for consumers and customers can pay for electricity through an application.</p>	<ul style="list-style-type: none"> • Project by Electricity Authority District 3

Initiative/Project		Description	Referred to the original plan.
No.	Connected Customer		
3	e-Tax Invoice/ e-Receipt	Preparation, delivery and storage of electronic tax invoices and electronic receipts. This project is supported by the National e-Payment Master Plan (2558) By the year 2560 e-Tax Invoice & e-Receipt can be delivered and stored through electronic mail.	• Project by Accounting and Finance

3. Next Generation Enterprise

Initiative/Project		Description	Referred to the original plan.
No.	Next Generation Enterprise		
No.	Digital Master Plan 2561 - 2565		
1	Enterprise Performance Management (EPM)	<p>It is a plan to create a real-time or near-real-time visualization system by automatically linking data and reporting with standard formats.</p> <p>Objectives:</p> <p>(1) To have near real-time reporting system to quickly respond to the situation, continuous improvement of performance and development.</p> <p>(2) To increase accessibility and employee engagement by providing appropriate access to employee positions.</p> <p>(3) The system can analyze "what-if" data and automatically adjust the auto-warning feature.</p>	
2	Prime Value Chain Analysis	<p>Prime value chain analysis helps in analyzing the various activities that are used in the business.</p> <p>Objectives:</p> <p>(1) To visualize in the organization's core value chain from start to finish.</p> <p>(2) Use insights to effectively manage costs and support organizational development.</p>	

Initiative/Project		Description	Referred to the original plan.
No.	Next Generation Enterprise		
3	Enterprise Content Management (ECM)	<p>A plan for organizing the project and create a variety of information management processes.</p> <p>Objectives:</p> <p>(1) To have a strategy and a single source data management system can be easily accessed. To use in both internal and external communication.</p> <p>(2) To have a structure for storing more data. And the information is different.</p> <p>(3) To be appropriate for the data format to be communicated through various channels.</p> <p>(4) To manage the outdated information properly, safely and efficiently.</p>	
4	Digital Strategy Refresh	<p>It is a project plan that aims to review the digital action plan. In response to rapid technological and business changes and this may affect the digital action plan.</p> <p>Objectives:</p> <p>(1) To review and improve PEA's digital operation plan to be up-to-date. In line with business and technology needs that may change in the future.</p>	

Initiative/Project		Description	Referred to the original plan.
No.	Next Generation Enterprise		
	The original plan		
1	CBS Phase 2	<p>Procurement and development of computer software systems for core businesses and integrating related systems.</p> <p>Objectives:</p> <p>(1) To design a system architecture for integrating core business software systems that cover all aspects of critical business processes. It emphasizes the connection of the system, processes to achieve the same standard for using data and scope of work is related or overlapping.</p> <p>(2) To develop and install software systems for core business included all related systems as integrated.</p> <p>(3) To enable the core business software system to connect to the relevant system. There are a coherent process and an analysis of the suitability of each system's connectivity approach. In terms of performance, connectivity and standardization of data, relative to the cost of development and connectivity,</p>	<ul style="list-style-type: none"> • ICT Master Plan Phase 3 2556-2560
2	Modern Warehouse Pilot Roll-out	<p>Improve the management and inventory management to modern warehouse. Technology such as barcode and RFID are used to manage inventory management and tracking of packages efficiently by piloting at Sakonnakhon Warehouse first and proceed to expand the modern warehouse to other areas.</p>	<ul style="list-style-type: none"> • Project by Administration Department
3	Sustainable Support System	<p>The development of sustainable support system to allow organizations to collect data for sustainability report effectively such as greenhouse gas emissions data, fuel consumption rate, etc. It may need to modify the workflow to be able</p>	<ul style="list-style-type: none"> • Project by Social and Environmental Affairs Department

Initiative/Project		Description	Referred to the original plan.
No.	Next Generation Enterprise		
		to record or distinguish information in the system automatically or develop a system to record values from the operator.	
4	Electronic Document System	It's Electronic Documentation Software. The objective is to improve and enhance the performance of the PEA. To comply with modern technology and bring the organization to the Smart Organization. To supports PEA 4.0 policy and Thailand 4.0. This system can support modern technology and it's replacing old systems that are not supported with modern technology such as can not create book via electronic form, cannot sign by using electronic signature and can not send and view documents in image file format (TIF/.TIFF) via mobile device.	<ul style="list-style-type: none"> • Project by Information Technology and Communication Department

4. Workforce of the Future

Project/Plan		Description	Referred to the original plan.
No.	Workforce of the Future		
	Digital Master Plan 2561 - 2565		
1	Human Capital Strategy	Planning and direction of PEA personnel development. Be responsive to the corporate strategy to run current business and be prepared for future business growth. PEA has started to set up core competency groups. This core competency project aims to review the work, to ensure that the organization can develop human resources appropriately and fully, to meet the needs of both business and technology and ready to be a digital enterprise by the year 2565.	
2	Workforce Development & Measurement	The project aims to support the learning of personnel according to the individual capabilities group (Core Competency). The assessment can be tracked and reported on learning outcomes. It also evaluates the performance of the personnel reflecting the actual performance and to motivate people to work.	
3	Employee Collaboration & Recognition	Developing a workforce collaboration and recognition system to focus on the involvement of personnel. To increase the satisfaction and collaboration of colleagues and organizations. This can be done through the PEA's internal social network. It can also increase motivation to work for high potential employees and it is very useful for future succession planning.	

Project/Plan		Description	Referred to the original plan.
No.	Workforce of the Future		
4	Workforce Planning & Sourcing	Organization and Talent Development Plan to operate smoothly and lead to future planned goals. The project needs to assess the capacity and the quality of personnel needed to meet the needs of the business properly and effectively.	
5	Innovation Center of Excellence (CoE)	Determining the direction of the development of innovative enterprise capabilities. To design innovation units to fit the operational and service needs, as well as develop abilities and skills. To strive for a progressive organization in the field of innovation. The process is to push forward the innovations developed by the PEA to commercialize such as PEA Hive, PEA Solar Application. Group of people is the growth of the organization. (Growth Engine)	
6	AI/ Chatbot for HR supports	It's a management support and personnel services system. It's automatic communication system for PEA personnel to respond the need of users and to satisfy users by providing the ability to answer questions, consult and present relevant information of personnel.	
7	HR Analytics	It's an analysis of key personnel information. The goal is to allow PEA to manage personnel by analyzing insights from each process's data collection. It's very useful for the decision-making process and the improvement of the human resources process from beginning to end and to meet the business goals quickly and efficiently.	

5. Digital Platform

Project/Plan		Description	Referred to the original plan.
No.	Digital Platform		
	Digital Master Plan 2561 - 2565		
1	IT Portfolio Management	<p>It's a plan to determine the strategies and guidelines for managing the technology and application of the organization. To setup the standard and consistent with the business vision. To concern with suitability and value in use and reduce redundancy by organizing application portfolios.</p> <p>Objectives:</p> <ul style="list-style-type: none"> (1) To standardize and define application development strategies. (2) To develop the change plan for PEA's application portfolio. (3) To analyze the value of your investment in the application. (4) To develop investment planning and follow up on the development of ICT projects in the organization. 	
2	Data Management Assessment and Pilot & Open Data Assessment	<p>It is the official data governance. It is designed to enforce the management of data assets and control the work of data to be accurate and appropriate.</p> <p>Objectives:</p> <ul style="list-style-type: none"> (1) To establish a Data Governance to manage the data well, standard and accurate. (2) To build the single source of truth. (3) To setup the standard of data for every unit can run reliable quality data at any time. 	

Project/Plan		Description	Referred to the original plan.
No.	Digital Platform		
3	IT-OT Convergence & Open Data Platform	<p>It is a project for linking information technology and operating technology. To make the integration of data standard and reliable and to build the single source of truth. To build platform for open data and big data.</p> <p>Objectives:</p> <ul style="list-style-type: none"> (1) To provide the standard of data. (2) To prepare for linking information technology and operating technology. (3) To create a large aggregate data source. 	
4	Big Data Platform	<p>It is a project to develop Big Data platform for huge amount of data and information in the future. Moreover, the project is to meet organization needs in data analytics and utilize it to develop organization, business and other aspects as well as to support decisions making.</p> <p>Objectives:</p> <ul style="list-style-type: none"> (1) To support Big Data (2) To analyze Big Data and utilize for organization and business development (3) To gather and process Big Data for decision making 	
5	Video Analytics	<p>It's a continuous project of CCTV IP: CCTV infrastructure in Headquarter, Rangsit office and other office areas and to build the foundation in the form of video analysis.</p>	

Project/Plan		Description	Referred to the original plan.
No.	Digital Platform		
6	Communication and Network	<p>PEA's network improvement and development covers the following projects:</p> <ul style="list-style-type: none"> (1) Improvement of office network (2) DWDM Bandwidth Network Expansion (to connects the headquarters with 5 Junctions) (3) UPS Procurement and Installation (4) IP Access Network Development (5) Fiber Optic Network Expansion (6) WAN Network Maintenance and Service (7) Unified Communication (UC) Development (8) PEA's Telephone System Development (9) VDO Conference Development (10) Digital Radio Improvement (11) Emergency Radio Development (12) CCTV IP: CCTV infrastructure Headquater + Rangsit + other office areas 	<ul style="list-style-type: none"> • ICT Master Plan Phase 3 2556-2560 • Project by Information Technology and Communication Department
7	Cyber Security Enhancement	Expanding the scope of work of PEA SOC to be the center of PEA's cyber security management. It covers both information technology and operating technology, control strategy, standards and security policy. Review risk assessments to find out how to prevent and respond to cyber security threats, it might cause from the linkage between information technology systems and operating technologies.	

Project/Plan		Description	Referred to the original plan.
No.	Digital Platform		
		<p>Extending the scope of ISO 27001 implementation to other areas and to cover the country.</p> <p>Objectives:</p> <p>(1) To build the collaboration between Information Technology and Technology Operations.</p> <p>(2) To provide centralized cyber security management of PEA, both in information technology and in operating technology.</p> <p>(3) To assess the potential risks of the linkage between information technology and operational technology. To follow the principles of situational management and information security such as SIEM – Security Information and Event Management. To protect the PEA from cyber security threats, included a secure network and to support the work of the Smart Grid and remote operating units.</p> <p>(4) To raise the standard for data security management systems to be more secure.</p>	
8	Infrastructure & Hardware	<p>PEA's Infrastructure Development and Hardware covers the following projects:</p> <p>(1) Procurement/PC & Equipment Replacement</p> <p>(2) e-Collaboration Service for Data Center</p>	<ul style="list-style-type: none"> • ICT Master Plan Phase 3 2556-2560 • Project by IT Department
9	DTO Governance	<p>It is the plan to set up the Digital Transformation Office Governance Working Group for Project Management. To drive the project under the Digital Roadmap can happen, speed up and step up to Digital Utilities in the future.</p>	

Project/Plan		Description	Referred to the original plan.
No.	Digital Platform		
		<p>Objectives:</p> <p>(1) To establish a DTO Governance for the overall management of all projects in the Digital Roadmap.</p> <p>(2) To push all PEA projects in the Digital Roadmap successfully and to become a Digital Utilities in the future.</p>	
10	EA Governance & Development	<p>It is the plan to set up an EA Governance for the creation of an enterprise architecture to demonstrate the structure and the link between work processes, information systems and technology within the organization.</p> <p>Objectives:</p> <p>(1) To set the standard for ICT development across all departments to maximize the value of investment.</p> <p>(2) To reduce the complexity of current conditions to reduce management costs.</p>	
11	COBIT Enhancement & ISO 38500 Standard Certification	<p>It is a plan to develop IT standards for PEA IT Governance under the COBIT framework and certify ISO 38500 standard certification.</p> <p>Objectives:</p> <p>(1) To develop IT standard and IT Governance of PEA under the COBIT framework, IT Risk Assessment and IT Security Master Plan</p> <p>(2) To certify ISO 38500 standard certification.</p>	

Project/Plan		Description	Referred to the original plan.
No.	Digital Platform		
12	ISO/IEC 20000 Standard Certification	<p>It is a standardized implementation of information technology. To increase user satisfaction by improving information technology services. To align with ITIL framework and enhance the information technology services with ISO 20000 standard certification.</p> <p>Objectives:</p> <p>(1) To apply ITIL's best practices for excellence in information technology services.</p> <p>(2) To certify ISO 20000 standard certification.</p>	
	The original plan		

Project/Plan		Description	Referred to the original plan.
No.	Digital Platform		
1	Network Development for supporting Data Center	<p>The original plan from ICT master plan 2556-2563.</p> <p>This scope is further enhanced in the high-speed local area network deployment, serving both enterprise and enterprise-wide requirements.</p> <p>Objectives:</p> <p>(1) To develop a secure processing center that can support the development of PEA's information technology in the long run.</p> <p>(2) To prepare the internal network of the PEA to move the data center of each system to the data center building.</p> <p>(3) To be able to provide information without interruption during the transfer of various systems to the data center building.</p>	<ul style="list-style-type: none"> • ICT Master Plan Phase 3 2556-2560

Project/Plan		Description	Referred to the original plan.
No.	Digital Platform		
2	Integrated Network Management System (INMS)	Integrated Network Management System Project. Objectives: To be the center of information and communication networks management Including all related systems. To be consistent with related technologies. To solve the problem quickly and control the QoS and provides SLA with various subsystems.	• ICT Master Plan Phase 3 2556-2560
3	Setup and link the communication systems between the Data Center and Disaster Recovery Center	Setup and link the communication systems between data center and disaster recovery center of PEA. It covers the procurement and installation of communication systems between the data center and disaster recovery center. (Continuing Plan 2562-2563)	• ICT Master Plan Phase 3 2556-2560
4	Design and setup IP Core Phase 2	Procurement of DWDM and IP / MPLS core router equipments with accessories for linking with the IP core network and developing the core network as the backbone of the 12 office areas and the PEA headquarter. There are at least 3 units of core router per office. Objectives: (1) To improve the core layer communication system to support IP network. (2) To split the bandwidth between core and access to reduce traffic on the access network. (3) To simplify the circuit through multiple nodes, multi-node ring and various	• ICT Master Plan Phase 3 2556-2560

Project/Plan		Description	Referred to the original plan.
No.	Digital Platform		
		<p>products and simplify the monitor through 2 NMS.</p> <p>(4) To make the traffic on the core network reliable (Reliability / Availability). Less electronically, resulting in less delay time.</p> <p>(5) To separate the management from the regional network is clear because more attention is needed.</p> <p>(6) Capacity can be expanded or adjusted without considering the impact on SDH / ASON because the systems have been separated absolutely</p> <p>(7) To support the information technology system between the internal departments and users that will be increasing in the future.</p>	
5	WAN Network Maintenance and Service	<p>It is a scope of work from ICT Security Master Plan that focus on maintenance and network services.</p> <p>Objectives: to maintain the network equipment, preventive equipment efficiency and the efficiency of the network.</p>	<ul style="list-style-type: none"> • ICT Master Plan Phase 3 2556-2560
6	Digital Radio Improvement	<p>It is a scope of work from ICT Security Master Plan. The scope of the design, supply and installation of digital radio system with equipment in 12 office areas and PEA headquarter.</p> <p>Objectives:</p> <p>(1) To solve the interference problem of using the radio to rectify the power failure.</p>	<ul style="list-style-type: none"> • ICT Master Plan Phase 3 2556-2560

Project/Plan		Description	Referred to the original plan.
No.	Digital Platform		
		<p>(2) To manage the radio frequency channel allocated by the NBTC to be effective.</p> <p>(3) The PEA has a radio system. It can be used to communicate and support the service to users conveniently and quickly.</p> <p>(4) To improve the PEA's radio system to be stable and effective.</p>	
7	The development of security systems for information technology in accordance with international standard ISO/IEC 27001:2013	<p>It is a scope of work from ICT Security Master Plan.</p> <p>Objectives:</p> <p>(1) To provide protection against threats and control devices.</p> <p>(2) To prevent the PEA's critical systems from being vulnerable to threats within and outside the organization and to prevent fraudulent activity that could occur if the system is vulnerable.</p> <p>(3) To formulate a plan to develop information security awareness for PEA employees in the country.</p> <p>(4) To publish information on information security through appropriate channels and easy access.</p> <p>(5) To develop information security knowledge for information technology staffs cover county and provinces.</p> <p>(6) To develop a security management system for PEA computer center and align with international standards.</p> <p>(7) Create a good image for information security management to PEA and PEA has been recognized by international standards.</p>	<ul style="list-style-type: none"> • ICT Master Plan Phase 3 2556-2560

Project/Plan		Description	Referred to the original plan.
No.	Digital Platform		
		(8) To be able to support surveillance and security response 24 hours a day. (9) To provide an information security monitoring tool that is ready for a breakthrough inspection. (Penetration Testing)	
8	Data Center Construction of PEA Headquarter	Data center construction of PEA headquarter to provide adequate service and support for future system expansion. Objective: (1) To provide information technology center of PEA, to support Increased information performance in the future and ready to take the situation in the event of a disaster (Disaster Cases). (2) To be able to expand and install the system, it is necessary to provide additional backup systems to the existing systems and that will happen in the future. (3) To develop a secure processing center that can support the development of PEA's information technology in the long run.	• ICT Master Plan Phase 3 2556-2560
9	IT Infrastructure Design and Consolidation for PEA (Link to DC Networking Development, INMS, DC/DR communication system)	Hardware procurement and resource management system for infrastructure. To provide the centralized ICT resources for setting up in data center and disaster recovery center to reduce data center usage. It covers the migration to the main data center and disaster recoverday center and staff training to manage hardware resources based on system capabilities.	• ICT Master Plan Phase 3 2556-2560

Project/Plan		Description	Referred to the original plan.
No.	Digital Platform		
10	Disaster Recovery Center Development and Construction (Link to DC Networking Development, INMS, DC/DR communication system)	<p>It is a scope of work from the original master plan. The scope has been improved and focus on disaster recovery center design and construction, setup infrastructure, facilities and networking systems.</p> <p>Objectives:</p> <p>(1) To develop a disaster recovery center that can support the same size infrastructure as the primary data center.</p> <p>(2) To provide IT services for in case of force majeure.</p>	<ul style="list-style-type: none"> • ICT Master Plan Phase 3 2556-2560
11	EA Tool Procurement	<p>It is an additional scope of work from the original master plan.</p> <p>The scope of work; to study enterprise architecture (EA), data collection for enterprise architecture, ICT management system for enterprise architecture, enterprise architecture design and import data into the system and setup policies and processes for enterprise architecture.</p> <p>The objectives:</p> <p>(1) To prepare an enterprise architecture for PEA so that PEA can have enterprise architecture information at each level in accordance with the principles of enterprise architecture which is linked and can be used for further management.</p> <p>(2) To develop and implement the systems according to the principles of enterprise architecture.</p> <p>(3) To create the prototype of enterprise architecture process to lead to future expansion throughout the organization.</p>	<ul style="list-style-type: none"> • ICT Master Plan Phase 3 2556-2560



Abbreviation

Function (Abbreviation)	Function (Full Name)
CS	Corporate Strategy Function
PSD	Planning and Power System Development Function
ENG	Engineering Function
CPM	Construction and Project Management Function
OM	Operation and Maintenance Function
R1	Electricity Authority Region 1
R2	Electricity Authority Region 2
R3	Electricity Authority Region 3
R4	Electricity Authority Region 3
ICT	ICT Function
AF	Accounting and Finance Function
GS	General Services Function
CSR	Corporate Social Responsibility Function
HR	Human Resources Department
OOG	Office of The Governor
LGO	Legal Office
IAB	Internal Audit Bureau