

## Ongoing and Planned Initiatives

Transmission System and Substation Development Project, 9 <sup>th</sup> Stage, Phase 1 (TSDP.9.1)						
1. Objectives	<ul style="list-style-type: none"> <li>- To serve an increasing demand especially in a large and medium industry in northern region.</li> <li>- To increase an efficiency and stability of power system.</li> <li>- To reduce problems of operation and maintenance as well as losses of power system.</li> </ul>					
2. Scope of work	Construction of 115 kV transmission system and substations in northern region					
3. Implementation Area	20 provinces in northern region					
4. Quantity of work	Details	Region				Total
		1	2	3	4	
	1) Construction of 115 kV transmission line with OPGW (cct.-km.)	325	-	-	-	325
	2) Construction of substation					
	2.1) 115-22/33 kV (cct.-km.)	19	-	-	-	19
	2.2) Installation of power transformer (MVA)	1,175	-	-	-	1,175
	3) Construction of 115 kV switching station (cct.-km.)	2	-	-	-	2
	4) Added/Replacement of power transformer (existing substation) (cct.-km.(MVA))	10 (400)	-	-	-	10 (400)
5) Installation circuit breaker 115 kV and Disconnecting Switch 115 kV	-	-	-	-	-	
5. Investment Cost	- Local Currency/Fund raising (M.Baht)	5,295	-	-	-	5,295
	- PEA's revenue (M.Baht)	1,765	-	-	-	1,765
	Total (M.Baht)	7,060	-	-	-	7,060
6. Benefits	<ol style="list-style-type: none"> <li>1) Increasing the capacity of power system to serve an increasing demand in northern region sufficiently.</li> <li>2) Providing electricity service sufficiently and efficiently.</li> <li>3) Increasing the stability and reliability of power system in northern region.</li> <li>4) Reducing problems of power system operation and maintenance.</li> <li>5) Increasing the competitiveness of Thailand by supporting economic development expanding into regional areas in accordance with the Government's policy.</li> </ol>					
7. Person in Charge	Project Director (Director of Project management Department 1)					
8. Status (September 2019)	74.75% of completion					

Transmission System and Substation Development Project, 9 <sup>th</sup> Stage, Phase 2 (TSDP.9.2)						
1. Objectives	<ul style="list-style-type: none"> <li>- To serve an increasing demand especially in a large and medium industry in northeastern region.</li> <li>- To increase an efficiency and stability of power system.</li> <li>- To reduce problems of operation and maintenance as well as losses of power system.</li> </ul>					
2. Scope of Work	Construction of 115 kV transmission system and substations in northeastern region.					
3. Implementation Area	19 Provinces in northeastern region					
4. Scope of Work	Details	Region				Total
		1	2	3	4	
	1) Construction of 115 kV transmission line with OPGW (cct.-km.)	-	212	-	-	212
	2) Construction of substation					
	2.1) 115-22kV (cct.-km.)	-	14	-	-	14
	2.2) Installation of power transformer (MVA)	-	750	-	-	750
3) Construction of 115 kV Switching station (cct.-km.)	-	4	-	-	4	
4) Added/Replacement transformer (existing substation) (cct.-km.(MVA))	-	15 (575)	-	-	15 (575)	
5. Investment Cost	- Local Currency/Fund raising (M.Baht)	-	3,405	-	-	3,405
	- PEA's revenue (M.Baht)	-	1,135	-	-	1,135
	Total (M.Baht)	-	4,540	-	-	4,540
6. Benefits	<ol style="list-style-type: none"> <li>1) Increasing the capacity of power system to serve an increasing demand in northeastern region sufficiently.</li> <li>2) Providing electricity service sufficiently and efficiently.</li> <li>3) Increasing the stability and reliability of power system in northeastern region.</li> <li>4) Reducing problems of power system operation and maintenance.</li> <li>5) Increasing the competitiveness of Thailand by supporting economic development expanding into regional areas in accordance with the Government's policy.</li> </ol>					
7. Person in Charge	Project Director (Director of Project management Department 2)					
8. Status (September 2019)	54.89% of completion					

Transmission System and Substation Development Project, 9 <sup>th</sup> Stage, Phase 3 (TSDP.9.3)						
1. Objectives	<ul style="list-style-type: none"> <li>- To serve an increasing demand especially in a large and medium industry in central region.</li> <li>- To increase an efficiency and stability of power system.</li> <li>- To reduce problems of operation and maintenance as well as losses of power system.</li> </ul>					
2. Scope of Work	Construction of 115 kV transmission system and substations in central region.					
3. Implementation Area	20 provinces in central region					
4. Quantity of Work	Details	Region				Total
		1	2	3	4	
	1) Construction of 115 kV transmission line with OPGW (cct.-km.)	-	-	203	-	203
	2) Construction of substation					
	2.1) 115-22kV (cct.-km.)	-	-	47	-	47
	2.2) Installation of power transformer (MVA)	-	-	4,450	-	4,450
	3) Construction of 115 kV switching station (cct.-km)	-	-	1	-	1
	4) Added/Replacement transformer (existing substation) (cct.-km.(MVA))	-	-	15 (750)	-	15 (750)
5. Investment Cost	- Local Currency/Fund raising (M.Baht)	-	-	11,314	-	11,314
	- PEA's revenue (M.Baht)	-	-	3,771	-	3,771
	Total (M.Baht)	-	-	15,085	-	15,085
6. Benefits	<ol style="list-style-type: none"> <li>1) Increasing the capacity of power system to serve an increasing demand in central region sufficiently.</li> <li>2) Providing electricity service sufficiently and efficiently.</li> <li>3) Increasing the stability and reliability of power system in central region.</li> <li>4) Reducing problems of power system operation and maintenance.</li> <li>5) Increasing the competitiveness of Thailand by supporting economic development expanding into regional areas in accordance with the Government's policy.</li> </ol>					
7. Person in Charge	Project Director (Assistant Governor (Construction and Project Management))					
8. Status (September 2019)	63.70% of completion					

Transmission System and Substation Development Project, 9 <sup>th</sup> Stage, Phase 4 (TSDP.9.4)						
1. Objectives	<ul style="list-style-type: none"> <li>- To serve an increasing demand especially in a large and medium industry in southern region.</li> <li>- To increase an efficiency and stability of power system.</li> <li>- To reduce problems of operation and maintenance as well as losses of power system.</li> </ul>					
2. Scope of Work	Construction 115 kV transmission system and substations in southern region.					
3. Implementation Location	18 provinces in southern region					
4. Quantity of Work	Details	Region				Total
		1	2	3	4	
	1) Construction of 115 kV transmission line with OPGW (cct.-km.)	-	-	-	255	255
	2) Construction of substation					
	2.1) 115-22kV (cct.-km.)	-	-	-	10	10
	2.2) Install Power Transformer (MVA)	-	-	-	550	550
	3) Construction of 115 kV Switching station (cct.-km.)	-	-	-	2	2
	4) Added/Replacement transformer (existing substation) (cct.-km.(MVA))	-	-	-	13 (625)	13 (625)
5. Investment Cost	- Local Currency/Fund raising (M.Baht)	-	-	-	3,360	3,360
	- PEA's revenue (M.Baht)	-	-	-	1,125	1,125
	Total (M.Baht)	-	-	-	4,485	4,485
6. Benefits	<ol style="list-style-type: none"> <li>1) Increasing the capacity of power system to serve an increasing demand in southern region sufficiently.</li> <li>2) Providing electricity service sufficiently and efficiently.</li> <li>3) Increasing the stability and reliability of power system in southern region.</li> <li>4) Reducing problems of power system operation and maintenance.</li> <li>5) Increasing the competitiveness of Thailand by supporting economic development expanding into regional areas in accordance with the Government's policy.</li> </ol>					
7. Person in Charge	Project Director (Director of Special Project Management Department)					
8. Status (September 2019)	61.59% of completion					

The Power Distribution System Reinforcement Project, 7 <sup>th</sup> Stage (PDRP.7)						
1. Objectives	- To increase the capacity and adequacy of distribution system in order to serve the increasing demand of existing and new customers especially in business sector, industrial sector, tourism sector, and various communities.					
2. Scope of Work	Construction and improvement of distribution systems					
3. Implementation Area	Countrywide					
4. Quantity of Work	Details	Region				Total
		1	2	3	4	
	1) Construction of high – voltage distribution system (main line) (cct.-km.)	4,140	3,900	3,860	2,530	14,430
	2) Installation of distribution transformers (kVA)	75,000	77,500	81,250	37,500	271,250
	3) Construction of low-voltage distribution system (cct.-km.)	375	390	410	190	1,365
	4) Installation of capacitors (kVAR)	116,500	196,100	214,100	199,600	726,300
	5) Installation of reclosers (kVAR)	130	215	240	215	800
	6) Installation of SF <sub>6</sub> gas switches (set)	410	570	1,210	770	1,960
	7) Installation of breaker (set)	22	39	-	7	68
5. Investment Cost	- Local Currency/Fund raising (M.Baht)	3,675	3,105	2,175	2,895	12,950
	- PEA's revenue (M.Baht)	1,225	1,035	1,095	965	4,320
	Total (M.Baht)	4,900	4,140	4,370	3,860	17,270
6. Benefits	1) Increasing the capacity of power system to serve an increasing demand. 2) Reducing losses in distribution system. 3) Supporting economic development especially industrial business which is expanding into regional areas in accordance with Government's policy					
7. Person in Charge	Project Director (Director of Project management Department 2)					
8. Status (September 2019)	100.00% of completion					

Distribution System Reliability Improvement Project, 3 <sup>rd</sup> Stage (DRIP. 3)						
1. Objectives	To increase the stability and reliability of power system in business, industrial and other important areas.					
2. Scope of Work	<ul style="list-style-type: none"> <li>- Installation of high quality equipment</li> <li>- Improvement in the connection of power systems</li> <li>- Construction of switching substation</li> </ul>					
3. Implementation Area	Countrywide					
4. Quantity of Work	Details	Region				Total
		1	2	3	4	
	1) Improve distribution system by using insulated cable (SAC) (cct.-km.)	1,206	1,204	1,358	1,202	4,970
	2) Upgrade distribution system in front of substations with narrow exits by using underground cable (cct.-km.)	22	21	30	28	101
	3) Construct 115 kV transmission line as well as incoming bay for 115 kV Loop Line (cct.-km.)	-	-	166	28	194
	4) Improve 115 kV disconnected equipment from air break switch to Load Break Switch/Circuit Switcher (Set)	10	28	84	7	129
	5) Installation of 115 kV Capacitor 115 (set)	1	1	-	1	3
	6) Improve the efficiency of substation (cct.-km.)	5	12	-	6	23
	7) Construction of Switching Station (cct.-km.)	-	-	3	-	3
5. Investment Cost	- Local Currency/Fund raising (M.Baht)	2,292	2,703	3,560	2,810	11,365
	- PEA's revenue (M.Baht)	764	900	1,189	937	3,790
	Total (M.Baht)	3,056	3,603	4,749	3,747	15,155
6. Benefits	<ul style="list-style-type: none"> <li>1) Being able to solve problems on outages and voltage dip in distribution systems.</li> <li>2) Reducing losses on outage and voltage dip in private sector.</li> </ul>					
7. Person in Charge	Project Director (Assistant Governor (Construction and Project Management))					
8. Status (September 2019)	84.10% of completion					

Submarine Cable for Pha-ngan island, Suratthani Province (Pha-Ngan)						
1. Objectives	<ul style="list-style-type: none"> <li>- To increase the capacity and stability of power system in order to serve the increasing demand on Pha-Ngan Island, Suratthani Province which is a major tourism location with relatively high economic growth.</li> <li>- To reduce problems of power system operation and maintenance.</li> <li>- To reduce losses in distribution system.</li> </ul>					
2. Scope of Work	Construction of Pha-Ngan Substation and 115 kV Submarine Cable extending from Samui 2 Substation					
3. Implementation Area	Pha-Ngan Island, Suratthani Province					
4. Quantity of Work	Details	Region				Total
		1	2	3	4	
	1) 115 kV Submarine Cable (cct.-km.)	-	-	-	15.48	15.48
2) Substation (1x50 MVA) (cct.-km.)	-	-	-	1	1	
5. Investment Cost	- Local Currency/Fund raising (M.Baht)	-	-	-	820	820
	- PEA's revenue (M.Baht)	-	-	-	274	274
	Total (M.Baht)	-	-	-	1,094	1,094
6. Benefits	<ul style="list-style-type: none"> <li>1) Being able to solve problems on outages and voltage dip in distribution systems.</li> <li>2) Reducing losses on outage and voltage dip in private sector.</li> </ul>					
7. Person in Charge	Project Director (Assistant Governor (Construction and Project management))					
8. Status (September 2019)	100% completed Electrification on 18 May 2017					



New Rural Household Electrification Project Phase 1 (NHEP.1)						
1. Objectives	To expand the distribution system to new household according to the government's policy to expand the economic into the regional and rural area.					
2. Scope of Work	Construct high – voltage and low – voltage distribution system, installation of transformers and meters.					
3. Implementation Area	Countrywide					
4. Quantity of Work	Details	Region				Total
		1	2	3	4	
	1) Number of households	32,639	41,887	31,060	25,043	131,629
	2) High – voltage distribution system (main line) (cct.-km.)	570	749	543	438	2,300
	3) Low – voltage distribution system (cct.-km.)	2,671	3,509	2,541	2,049	10,770
	4) Transformers (KVA)	22,390	29,420	21,310	17,180	90,300
	5) Meters (set)	32,639	41,887	31,060	25,043	131,629
5. Investment Cost	- Local Currency/Fund raising (M.Baht)	690	900	655	521	2,761
	- PEA's revenue (M.Baht)	225	302	220	179	926
	Total (M.Baht)	915	1,202	870	700	3,687
6. Benefits	<p>1) Supporting government's policy by expanding the electricity to non-electrified household which is expected to meet 131,000 of new consumers.</p> <p>2) Saving energy consumption expense of household and country and expanding the economic development to regional and rural area.</p> <p>3) Improving the quality of life and reducing social inequality so people perceive that they are always taken care of by the government.</p>					
7. Person in Charge	Project Director (Deputy Governor (Planning and Power System Development))					
8. Status (September 2019)	100.00% of completion					

Remote Rural Household Electrification Project (RHEP)						
1. Objectives	To expand the distribution system to remote household to be completely electrified according to government policy.					
2. Scope of Work	Construct high – voltage and low – voltage distribution system, installation of transformers and meters.					
3. Implementation Area	Countrywide					
4. Quantity of Work	Details	Region				Total
		1	2	3	4	
	1) Number of households	2,605	4,242	1,617	3,138	11,602
	2) High – voltage distribution system (main line) (cct.-km.)	312	425	208	291	1,236
	3) Low – voltage distribution system (cct.-km.)	408	769	268	474	1,919
	4) Transformers (KVA)	7,620	14,320	5,860	8,550	36,350
5) Meters (set)	2,605	4,242	1,617	3,138	11,602	
5. Investment Cost	- Local Currency/Fund raising (M.Baht)	222	301	151	236	910
	- PEA's revenue (M.Baht)	76	100	50	79	305
	Total (M.Baht)	298	401	201	315	1,215
6. Benefits	<p>1) Supporting government's policy and strategic plan of the Ministry of Interior by expanding the electrification to remote household which is expected to 11,600 households.</p> <p>2) Increasing productivity, supporting business and industry in rural area, reducing fuel expense which can lead to the growth of economic, increasing local employment, reducing revenue inequality, and expanding the economic to regional and rural area.</p> <p>3) Improving the quality of life and reducing the migration to major cities.</p> <p>4) Perceiving that people are always taken care of by the government.</p>					
7. Person in Charge	Project Director (Deputy Governor (Planning and Power System Development))					
8. Status (September 2019)	100.00% of Completion					

Distribution System Extension for Agricultural Areas Project, 2 <sup>nd</sup> Stage (DEAP.2)						
1. Objectives	- To procure electricity supply into agricultural areas in order to support agricultural products as well as to develop grassroots-level economy leading to sustainable countryside development					
2. Scope of Work	Construct Medium and Low Voltage Distribution System, Install distribution transformers and Meters					
3. Implementation Area	Countrywide					
4. Quantity of Work	Details	Region				Total
		1	2	3	4	
	1) Household	15,841	18,568	4,410	1,781	40,600
	2) High – voltage distribution system (main line) (cct.-km.)	976	1,142	272	110	2,500
	3) Low – voltage distribution system (cct.-km.)	1,483	1,737	413	167	3,800
	4) Transformers (KVA)	858	1,006	239	97	2,200
	5) Meters (set)	15,841	18,568	4,410	1,781	40,600
5. Investment Cost	- Local Currency/Fund raising (M.Baht)	594	697	165	66	1,522
	- PEA's revenue (M.Baht)	198	232	55	23	508
	Total (M.Baht)	792	929	220	89	2,030
6. Benefits	1) Electrifying to agricultural areas, reducing fuel cost, installation and maintenance expenses of agricultural engine. 2) Reducing pollution like noise, waste, and exhaust of agricultural engine.					
7. Person in Charge	Project Director (Deputy Governor (Planning and Power System Development))					
8. Status (September 2019)	63.91% of Completion					

Submarine Cable Extension to Islands Project (Kood, Mak Islands, Trat Province) (SEIP)				
1. Objectives	To develop power system in order to increase the capacity and the stability in distribution system to serve the increasing demand on Kood and Mak islands which are major tourism location with relatively high economic growth.			
2. Scope of Work	Construct 22 kV Submarine Cable extending from Klong Yai District, Trat Province to Koh Kood and Koh mak			
3. Implementation Area	Kood and Mak islands ,Trat Province			
4. Quantity of Work	Details	Region		Total
		Kooh island	Mak island	
	1) Submarine Cable	33	17	50
	2) Distribution system			
	2.2) High – voltage distribution system (main line) (cct.-km.)	15	9	7
2.3) Low – voltage distribution system (cct.-km.)	10	7	17	
2.4) Transformers (KVA)	350	150	500	
5. Investment Cost	- Local Currency/Fund raising (M.Baht)	737	322	1,059
	- PEA's revenue (M.Baht)	246	108	354
	Total (M.Baht)	983	430	1,413
6. Benefits	1) Increasing the capacity and the stability of power system in order to achieve adequate and reliable supply. 2) Reducing fuel costs of diesel generator of PEA and customers 3) Supporting for economic development especially tourism in accordance with government's policy.			
7. Person in Charge	Project Director (Assistant Governor (Construction and Project management))			
8. Status (September 2019)	100.00% of Completion			

Distribution System Dispatching Center Improvement Project (DDIP)						
1. Objectives	<ul style="list-style-type: none"> <li>- To develop and enhance efficiency of 12 Distribution System Dispatching centers.</li> <li>- To integrate new system with other related systems in order to improve the efficiency and management of main communication backbone of PEA.</li> </ul>					
2. Scope of Work	Improve hardware and software according to PEA Smart Grid development, integrating with other system like Outgae management system (OMS), Geographic Information System (GIS), Automatic Meter Reading (AMR) and Distributed Generation.					
3. Implementation Area	Countrywide					
4. Quantity of Work	Details	Region				Total
		1	2	3	4	
	1) Improve efficiency of hardware and software in the dispatching center.	3	3	4	3	13
	2) Installation of FRTU (set)	635	404	2,955	576	4,570
	3) Installation of MAR Remote (set)	763	621	3,197	789	5370
	4) Installation of MAR Master Radio (set)	31	33	108	28	200
	5) Installation of(cctV at Substation Unmanned (set)	93	94	126	87	400
	6) Improve the efficiency of the substation to meet the IEC 61850 standard.(cct.-km.)	-	-	14	6	20
	7) Installation of Optical Fiber Cable	300	313	1,000	287	1,900
	8) Construct Data Center Building	-	-	1	-	1
	9) Installation of network control center (NOC)	-	-	1	-	1
5. Investment Cost	- Local Currency/Fund raising (M.Baht)	435	335	2,175	450	3,395
	- PEA's revenue (M.Baht)	145	115	725	150	1,135
	Total (M.Baht)	580	450	2,900	600	4,530
6.Benefits	<ul style="list-style-type: none"> <li>1) Expanding the dispatching system to cover further area leading to the reducing of duration of power outage</li> <li>2) Improving the efficiency and quality of dispatching system management.</li> <li>3) Improving the efficiency of substation, the security in substation area as well as reducing cost of operation in substation.</li> <li>4) Enhancing the efficiency of communication management of organization as well as supporting communication business in the future.</li> </ul>					
7. Person in Charge	Project Director (Deputy Governor (Operation and Maintenance))					
8. Status (September 2019)	30.02% of Completion					

Power System Development for Special Economic Zone Project, 1 <sup>st</sup> Stage (SEZP.1)			
1. Objectives	To support the government's policy to set up a special economic development zone in order to achieve the adequate and reliable supply in the Special Economic Zone.		
2. Scope of Work	Construct substation, 115 kV Transmission Line, 22 kV and 33 kV distribution system, Low – voltage 380/230 V distribution system, and install distribution transformers		
3. Implementation Area	Mae Suat, Tak Province, Aranyaprathet, Sa Kaeo Province, Klong Yai, Trat Province, Muang, Mukdahan Province, Sadao, Songkhla Province and Muang, Nong Khai Province.		
4. Quantity of Work	Detail	Total	Unit
	1) Substation		
	1.1) Construct new substation	6	station
	1.2) Add transformer in existing substation	1	station
	2) 115 kV Transmission lines	148	Cct.-km.
	3) High – voltage distribution system		
	3.1) 22 kV	323	Cct.-km.
	3.2) 33 kV	64	Cct.-km.
4) Distribution Transformers	36,830	KVA	
5) Low – voltage distribution system	787	Cct.-km.	
5. Investment Cost	- Local Currency/Fund raising (M.Baht)	2,355	
	- PEA's revenue (M.Baht)	785	
	Total (M.Baht)	3,140	
6. Benefits	1) Supporting government's policy for infrastructure adjustment of business in industrial sector in order to support the establishment of special economic development zone. 2) Increasing the capacity of electricity supply to serve the increasing demand. 3) Supporting and promoting diversification into the region leading to the increasing local employment as well as reducing migration to major cities. 4) Increasing the value of economic of each province like increasing of land price and also enhancing the economics of hotel, housing, wholesale and retail.		
7. Person in Charge	Project Director (Director of Project Management Department 1)		
8. Status (September 2019)	28.68% of Completion		

Smart Grid in Pattaya City, Chonburi Province Project (SGPC)			
1. Objectives	<ul style="list-style-type: none"> <li>- To study technology, design, and implementation of Smart Grid in Pattaya City in order to expand to other areas.</li> <li>- To increase the efficiency and stability of distribution system, distributed generation connection as well as reducing problem and cost of operation.</li> </ul>		
2. Scope of Work	Develop and install smart grid equipment		
3. Implementation Area	Pattaya City, Chonburi Province		
4. Quantity of Work	Detail	Total	Unit
	1) Installation of Smart Meter	116,308	set
	2) Installation of Smart System of Power Interruption Solution	1	system
	3) Installation of Substation Automation	3	station
	4) Installation of IT Integration System	1	system
5. Investment Cost	- Local Currency/Fund raising (M.Baht)	800	
	- PEA's revenue (M.Baht)	269	
	Total (M.Baht)	1,069	
6. Benefits	<ol style="list-style-type: none"> <li>1) Being able to study the design of system deployment of smart grid in order to learn its advantages and constraints for expanding to target area.</li> <li>2) Reducing the expense of outsource for meter reading and the expense of meter connect-disconnect operation.</li> <li>3) Reducing the losses of revenues caused by electricity violation and defective equipment (Non-technical loss) as well as reducing the losses in electromechanical meter and the discrepancy of reading meter (Technical Loss)</li> <li>4) Reducing peak demand leading to the delay of investment in power generation</li> <li>5) Being able to reduce the restoration time and know the outage incident immediately leading to the increased opportunity for electricity sale, reducing customer damages caused by power outage. In addition, customer is able to investigate their energy usage whenever they want.</li> <li>6) Increasing the efficiency in power system planning and small distributed generation connection</li> </ol>		
7. Person in Charge	Project Director (Deputy Governor (Planning and Power System Development))		
8. Status (September 2019)	64.61% of Completion		

Transmission and Distribution Development Project, 1 <sup>st</sup> Stage (TDDP.1)						
1. Objectives	<ul style="list-style-type: none"> <li>- To develop power system to serve an increasing demand.</li> <li>- To increase the efficiency of stability and reliability of power system.</li> <li>- To reduce problems of operation and maintenance</li> <li>- To reduce the losses in distribution system</li> </ul>					
2. Scope of Work	Construct substation, transmission system and distribution system as well as install quality and standard equipment in order to improve and extend power system to business area, industrial area, community and other important area.					
3. Implementation Area	Countrywide					
4. Quantity of Work	Detail	Total				Unit
		1	2	3	4	
	1) Construct substation/Switching substation(cct.-km.)	13	19	32	8	72
	2) Renovate substation(cct.-km.)	8	3	2	5	18
	3) Construct 115 kV transmission lines/loop line (cct.-km..)	294	464	508	332	1,598
	4) Add/change power transformer (MVA)	250	375	400	450	1,475
	5) Purchase land in advanced for substation of next PEA Develop Plan(cct.-km.)	11	11	27	5	54
	6) Construct 22/33 kV distribution system (cct.-km.)	3,381	3,300	1,364	2,880	7,787
	7) Improve 22/33 kV distribution system (cct.-km.)	2,511	2,954	875	3,368	9,685
	8) Construct low – voltage distribution system (cct.-km.)	788	667	653	1,245	3,353
9) Improve low – voltage distribution system (cct.-km.)	2,752	3,131	843	2,050	8,777	
5. Investment Cost	- Local Currency/Fund raising (M.Baht)	11,755	11,820	12,149	11,285	47,009
	- PEA's revenue (M.Baht)	3,920	3,945	4,040	3,765	15,670
	Total (M.Baht)	15,675	15,765	16,189	15,050	62,679
6. Benefits	<ol style="list-style-type: none"> <li>1) Increasing the capacity of the power supply to adequately serve the growth demand from 17,612 MW in year 2013 to 24,037 MW in year 2021 with the annual growth rate of 3.96%</li> <li>2) Providing electricity service to customers sufficiently and efficiently that is expected to increase from 17.16 million customers in year 2013 to 20.18 million customers in year 2021</li> <li>3) Increasing the quality of electricity service to achieve the stability and reliability of power system which is expected to reduce SAIFI and SAIDI</li> <li>4) Reducing problems of power system operation and maintenance</li> <li>5) Increasing the capacity of competitiveness of Thailand by supporting economic development expanding into regional areas in accordance with the government's policy</li> </ol>					
7. Person in Charge	Project Director (Deputy Governor (Construction and Management Project))					
8. Status (September 2019)	11.15% of Completion (The Cabinet approved the project on November 1, 2016)					



Geographic Information System Development Plan, 3 <sup>rd</sup> Stage			
1. Objectives	<ul style="list-style-type: none"> <li>- To develop the Geographic Information System (GIS) to cover countrywide customers with the stability and reliability of the system and readiness of using.</li> <li>- To support the connection of GIS with other main systems of PEA.</li> </ul>		
2. Scope of Work	<ol style="list-style-type: none"> <li>1) Improve and design Data Model in order to support an operation connecting with other information technology</li> <li>2) Procure computer hardware and software of countrywide PEA Office</li> <li>3) Procure computer hardware and software</li> <li>4) Train a group of trainer on technical knowledge and technique of use</li> </ol>		
3. Implementation Area	Countrywide		
4. Quantity of Work	Details	Total	Unit
	1) Installation of Main site and GIS Software	1	System
	2) Installation of Disaster Recovery Site and GIS Software	1	System
	3) Development of GIS Application Program	1	System
	4) Improvement of power system database	1	System
	5) Installation of Computer at countrywide PEA Office	2,497	unit
5. Investment Cost	- Local Currency/Fund raising (M.Baht)	1,560	M.Baht
	- PEA's revenue (M.Baht)	530	M.Baht
	Total	2,090	
6. Benefits	<ol style="list-style-type: none"> <li>1) Increasing customer's satisfaction with a quick and convenient service.</li> <li>2) Increasing operator's satisfaction in using GIS</li> <li>3) Increasing the accuracy and modernization of GIS and obtaining database structure which is able to support the connection with other PEA information technologies as well as smart grid system</li> <li>4) Increasing the potential in management and maintenance of power system</li> <li>5) Providing data analysis for executive in planning and decision making of policy</li> </ol>		
7. Person in Charge	System Planning Department (Power System Geo-Informatics Division)		
8. Status (September 2019)	Under the process delivering the computer with software installation and related.		

The 115 kV Submarine Cable Extension to Samui Island, Suratthani Province Project for Replacement and Power Reinforcement			
1. Objectives	<ul style="list-style-type: none"> <li>- To replace the used up 33 kV submarine cable which operated to the end of its lifespan of 30 years in 2017 and the defective 115 kV oil-filled submarine cable in order to serve the increasing demand.</li> <li>- To increase the capacity and stability of electrification on Samui, Pha-Ngan and Tao Islands which are major tourism locations with relatively high economic growth</li> <li>- To reduce the outage cost</li> </ul>		
2. Scope of Work	Construction of 115 kV Submarine cable extended from Khanom Substation to Koh Samui 1 Substation		
3. Implementation Area	Samui Island, Surratthani Province		
4. Quantity of Work	Detail	Total	Unit
	1) 115 kV Submarine Cable, 500 sq.mm.	26	cct.-km..
	2) Installation of Distributed Temperature Sensing (DTS)	1	set
	3) Installation of Synchronous closing Breaker	1	set
	4) Add transmission bay at Koh Samui 1 Substation	3	set
5. Investment Cost	- Local Currency/Fund raising (M.Baht)	1,597	M.Baht
	- PEA's revenue (M.Baht)	533	M.Baht
	Total (M.Baht)	2,130	M.Baht
6. Benefits	<ol style="list-style-type: none"> <li>1) Increasing the capacity and security of power system on Samui Island, Suratthani Province in order to achieve the adequate and reliable supply.</li> <li>2) Providing electricity service efficiently and reducing problems on outages and voltage dip as well as losses in power system</li> <li>3) Reducing problems of power system operation and maintenance as well as support an economic development especially tourism in accordance with the government's policy</li> </ol>		
7. Person in Charge	System Planning Department (Project Planning Division)		
8. Status (September 2019)	29.69% of Completion		

Micro Grid Development Project at Mae Sareang District, Mae Hongson Province			
1. Objectives	<ul style="list-style-type: none"> <li>- To procure an energy source supplying to a remote area which lacks of power supply in order to reduce the investment in peak demand management.</li> <li>- To develop generation and distribution systems efficiently in order to increase the reliability and quality of power system.</li> <li>- To develop power system in the project area to be compatible with Smart Grid technology.</li> <li>- To promote an increase in renewable energy according to government's policy in order to reduce greenhouse gas and CO<sub>2</sub> emissions.</li> </ul>		
2. Scope of Work	Installation of energy storage system and microgrid system		
3. Implementation Area	Mae Sariang District, Mae Hong Son Province		
4. Quantity of Work	Detail	Total	Unit
	1) Installation of Microgrid Controller (Local Microgrid Control Building with BEMS)	1	System
	2) Installation of Battery Storage System 3.0 MW/1.5 MWh of Lithium Ion Type	1	System
	3) Interface Devices to MSR Substation		
	4) Communication System among MGC, Substation and Switching Equipment	1	System
	5) Installation of switching equipment for FLISR and Load Shedding Function	1	set
	6) Improvement of local diesel generator	1	unit
5. Investment Cost	- Local Currency/Fund raising (M.Baht)	185	M.Baht
	- PEA's revenue (M.Baht)	80	M.Baht
	Total (M.Baht)	265	M.Baht
6. Benefits	<ol style="list-style-type: none"> <li>1) Reducing the energy cost of diesel generation for supplying electricity to a remote area.</li> <li>2) Reducing the losses in transmission and distribution systems</li> <li>3) Reducing the greenhouse gas and CO<sub>2</sub> emissions.</li> <li>4) Increasing the efficiency, stability and reliability of generation and distribution systems in Mae Sariang District, Mae Hong Son Province and reducing problems of power outage in order to increase the customer's satisfaction in quality and service of electricity.</li> </ol>		
7. Person in Charge	System Planning Department (Smart Grid Planning Division)		
9. Status (September 2019)	93.05% of completion (Cabinet approval on 1 November 2016)		

System Voltage Conversion from 33 kV to 22 kV Project in the Southern Region, 1 <sup>st</sup> Stage			
1. Objectives	To improve the reliability of power system and increase the efficiency of system administration		
2. Scope of Work	Adjust distribution transformer and distribution line		
3. Implementation Area	Ranong and Phuket Provinces		
4. Quantity of Work	Detail	Total	Unit
	1) Change Power Transformer	16	set
	2) Change 33 kV to 22 kV distribution system	1,050	cct.-km..
	3) Change Current Transformer / Potential Transformer	2,060	set
	4) Change distribution transformer	11,110	set
5. Investment Cost	- Local Currency/Fund raising (M.Baht)	799	M.Baht
	- PEA's revenue (M.Baht)	266	M.Baht
	Total (M.Baht)	1,065	M.Baht
6. Benefits	1) Reducing the problems of partial discharge and pollution of using space aerial cable in high voltage distribution system in southern region 2) Increasing the reliability of power system in southern region 3) Increasing the efficiency in materials management and load transfers in southern region		
7. Person in Charge	System Planning Department (Project Planning Division)		
8. Status (September 2019)	Under consideration of feasible investment and a long term plan		

Development Plan for Power Interruption Analysis and Solution Center			
1. Objectives	<p>To improve efficiency of Electricity Operation Center for 12 Regional offices throughout the country</p> <p>To increase efficiency of operation method and EO's quality of life</p> <p>To increase customer's satisfaction by improved response to outage events</p> <p>To reduce duration and cost of outage management operation</p>		
2. Scope of Work	<p>Renovate/Construct Buildings for Electricity Operation Center</p> <p>Procure hardware, software, and vehicle navigation and tracking system</p>		
3. Implementation Area	Countrywide		
4. Scope of Work	Details	Total	Unit
	1) Renovate/Construct office Building	145	Building
	2) Procure hardware	120	Set
	3) Procure vehicle navigation and tracking system	72	Set
	4) Procure Server, and Web/Map & Tracking Server and Database	1	Set
	5) Procure Software and Application for Outage Management System	15	Set
5. Investment Cost	- Local Currency/Fund raising (M.Bath)	529	M.bath
	- PEA's revenue (M.Bath)	176	M.bath
	Total (M.Bath)	705	M.bath
6. Benefits	<p>1) Increasing the efficiency and reliability of power system</p> <p>2) Reducing losses in transmission and distribution systems</p> <p>3) Reducing cost of power generation from fossil fuel</p> <p>4) Reducing greenhouse gas emission</p>		
7. Person in Charge	Project Director (Deputy Governor (Operation and Maintenance))		
8. Status (September 2019)	<p>This plan is divided into 3 phases</p> <p>Phase I Pilot Project : 12 Electricity Operation Centers have been completely.</p> <p>Phase II Pilot Project : 23 Electricity Operation Centers have been 22 place completely.</p> <p>Phase III Pilot Project : 144 Electricity Operation Centers have been 27 place completely.</p>		

Major Cities Power System Development Project, 1 <sup>st</sup> Stage			
1. Objectives	- To increase stability and reliability of power system, reduce problems of operation, maintenance, and safety.		
2. Scope of Work	- Construction and improvement of power system as well as installation of equipment in the project areas.		
3. Implementation Area	Chiang Mai Municipality, Nakhon Ratchasima Municipality, Pattaya City and Hat Yai Municipality.		
4. Quantity of Work	Detail	Total	Unit
	1) Construction of 115/22 -33 KV Substation	4	station
	2) Construction of 115 kV Transmission System (OH and UG)	56	Cct.-km.
	3) Construction of Underground Distribution Systems		
	3.1) 22/33 kV Underground Cable	119	cct.-km.
	3.2) LV Underground Cable	771	cct.-km.
	3.3) Unit Substation 22/33 kV – 400/230 V	278	set
	4) Construction of OH Distribution System	460	cct.-km.
5. Investment Cost	- Local Currency/Fund raising (M.Baht)	8,750	M.Baht
	- PEA's revenue (M.Baht)	2,920	M.Baht
	Total (M.Baht)	11,670	M.Baht
6. Benefits	1) Increasing the stability and reliability of power system by reducing SAIFI and SAIDI equal to metropolis of other countries. 2) Providing electricity service in a density community adequately, effectively and safely according to the international standards. 3) Accommodating new technology used in development of an economic area in order to increase the growth of economic, and increase the competitiveness of Thailand. 4) Reducing problems and duration of power system operation and maintenance. 5) Accomplishing an aesthetic landscape.		
7. Person in Charge	Project Director (Assistant Governor (Construction and Project Management))		
8. Status (September 2019)	15.33% of completion (Cabinet approval on 14 February 2017)		

PEA Small Hydropower Development at Dams of Royal Irrigation Department Project						
1. Objectives	1) To encourage the generation from renewable energy in order to replace the use of fossil fuel and reduce the global warming 2) To increase the efficiency of electrification in the vicinity of the power plant with the stability of power system 3) To reduce the fuel imported from other country for electricity generation 4) To increase the usefulness of floodgate and reservoir of the Royal Irrigation Department					
2. Scope of Work	Construction of 10 hydroelectric power plants and installation of a kinetic hydropower pilot project					
3. Implementation Area	1) Muang, Lampang 2) Pluakdaeng, Rayong 3) Bo Rai, Trat 4) Lomsak, Phetchabun 2) Doi Saket, Chiang Mai 6) Bo Ree, Trat 7) Wang Chan, Rayong 8) Muang Trat 3) Sadao District, Songkhla 10) Phangkhon District, Sakon Nakhon					
4. Quantity of Work	Detail	Region				Total
		1	2	3	4	
	1) Potential Energy (place)	3	1	5	1	10
2) kinetic Energy (place)	1	-	-	1	2	
5. Investment Cost	- Local Currency/Fund raising (M.Baht)	-	-	-	-	-
	- PEA's revenue (M.Baht)	391.01	276.10	54.20	86.66	807.97
	Total (M.Baht)	391.01	276.10	54.20	86.66	807.97
6. Benefits	1) Reducing electrical energy purchased from Electricity Generating Authority of Thailand by approximately 52.19 GWh/year 2) Promoting corporate image of PEA in the role of renewable energy organization accordance with the Thailand's Alternative Energy Development Plan with the target of hydropower generation of 1,608 MW within 2021 3) Providing knowledge to PEA's employee for expanding their knowledge in business and social 4) Reducing greenhouse gas emission from fossil fuels by approximately 26,686 Tons CO2/year					
7. Person in Charge	Project Director (Director of Special Project Management Department) /(Corporate Business Development Division)					
8. Status (September 2019)	Hiring consultant for feasibility study in 2 areas which are Lampang and Chiang Mai Provinces.					

Power System Development for Special Economic Zone Project, 2 <sup>nd</sup> Stage						
1. Objectives	To develop power system by constructing substation, 115 kV transmission and 22,33 kV distribution systems as well as installing distribution transformer and 380/220 V distribution system in order to achieve the adequate and reliable supply in the Special Economic Zone, 2 <sup>nd</sup> stage.					
2. Scope of Work	<ul style="list-style-type: none"> <li>- Construction of 4 substations</li> <li>- Installation of power transformer in 4 existing substation</li> <li>- Construction of 115 kV transmission, 22/33 kV distribution system and 380/220 V distribution system</li> <li>- Installation of distribution transformer</li> </ul>					
3. Implementation Area	1) Mae sai, Chiang san, Chiang kong Districts, Chiang Rai Province 2) Tha u-tain, Mueang Districts, Nakorn Pha Nom Province 3) Mueang District, Kanchanaburi Province 4) Su ngai go lok, Tak bai, Wang, Yi ngo, Mueang District, Narathiwat Province					
4. Quantity of Work	Detail	Region				Total
		1	2	3	4	
	1) Substation					
	1.1) Construction new substation 115-22/33 kV	1	1	1	1	1
	1.2) Installation of power transformer (MVA)	50	50	50	50	200
	2) Add/Change power transformer in existing substation (MVA)	150	50	-	-	200
	3) Construction/Improvement of 115 kV transmission (cct.-km)	2	36	50	42	150
	4) Construction/Improvement of 22/33 kV distribution (cct.-km)	310	289	148	192	939
	5) Construction/Improvement of low voltage distribution system (cct.-km)	277	168	119	88	652
	6) Installation of distribution transformer (kVA)	16,420	9,970	7,030	5,140	38,560
5. Investment Cost	- Local Currency/Fund raising (M.Baht)	949	855	544	652	3,000
	- PEA's revenue (M.Baht)	316	285	181	218	1,000
	Total (M.Baht)	1,265	1,140	725	870	4,000
6. Benefits	1) Supporting government's policy for infrastructure adjustment of business in industrial sector in order to support the establishment of special economic development zone, 2 <sup>nd</sup> stage 2) Increasing the capacity of electrification to serve the demand growth. 3) Supporting and promoting diversification into the region which leads to the increasing of local employment as well as reducing of migration to major cities.					



Power System Development for Special Economic Zone Project, 2 <sup>nd</sup> Stage	
	4) Increasing the value of economic of each province like increasing of land price and also enhancing the economics of hotel, housing, wholesale and retail.
7. Person in Charge	Project Director (Director of Project Management Department 1)
8. Status (September 2019)	7.32% of completion Cabinet approval on 1 <sup>st</sup> August 2017

Transmission and Distribution Development Project 2 <sup>nd</sup> Stage						
1. Timeline	2019 - 2023					
2. Objectives	<ul style="list-style-type: none"> <li>- To develop power system to serve the increasing demands growth.</li> <li>- To increase the efficiency of stability and reliability of power system.</li> <li>- To reduce the problems of operation and maintenance.</li> <li>- To reduce the losses in distribution system.</li> <li>- To construct substation, transmission and distribution systems as well as install quality and standard equipment in order to improve the power stability and extend power system to business area, industrial area, community and other important area.</li> </ul>					
3. Implementation Area	Countrywide					
4. Quantity of Work	Detail	Region				Total
		1	2	3	4	
	1) Construct substation/Switching Substation	11	12	32	7	62
	2) Add/change power transformer(cct.-km.)	5	5	6	3	19
	3) Renovated substation(cct.-km.)	7	5	16	3	31
	4) Purchase land in advanced for substation of next PEA Development Plan(cct.-km.)	16	8	11	8	43
	5) Construct/Improve 115 kV transmission lines (cct.-km)	330	562	455	379	1,726
	6) Construct/Improve 22/33 kV distribution system (cct.-km)	2,629	3,805	3,968	2,175	12,577
	7) Construct/Improve low voltage distribution system (cct.-km.)	6,470	6,345	2,647	7,108	22,570
	8) Mobile Transformer (set)	1	1	7	1	10
4. Investment Cost (M.Baht)	- Local Currency/Fund raising (M.Baht)	12,427	12,995	20,708	12,085	58,215
	- PEA's revenue (M.Baht)	4,143	4,332	6,903	4,028	19,405
	Total	16,570	17,327	27,610	16,113	77,620
5. Benefits	<ol style="list-style-type: none"> <li>1) Serving an increasing demand adequately, stably and reliably</li> <li>2) Providing power system safely and environmentally friendly.</li> <li>3) Reducing the power failure problem and losses in power system</li> <li>4) Reducing problems of power system operation and maintenance</li> <li>5) Supporting the economic development especially business and industrial sectors which expand into regional areas in accordance with the government's policy</li> <li>6) Supporting power producer from renewable and alternative energy with the capacity of 3,300 MW without exceeding EGAT's grid capacity</li> </ol>					
6. Person in Charge	System Planning Department (Project Planning Division)					
7. Status (September 2019)	Conducting the feasibility study					

Major Cities Power System Development Project, 2 <sup>nd</sup> Stage						
1. Timeline	2019 – 2023					
2. Objectives	- To increase the stability and reliability of power system and reduce problems of operation, maintenance, and safety by constructing and improving power system as well as installing equipment.					
3. Implementation Area	1) Nakorn sawan Municipality 2) Khon Kaen Municipality 3) Hua Hin City 4) Phuket Municipality					
4. Quantity of Work	Detail	Region				Total
		1	2	3	4	
	1) Construction of 22/33 kV UG Cable System (cct.-km.)	26	25	-	66	117
	2) Construction of LV UG Cable System (cct.-km.)	201	141	-	447	789
	3) Improvement of 22/33 kV Overhead distribution system (cct.-km.)	97	81	-	230	408
4) Construction for Communication System Support (cct.-km.)	26	17	-	64	107	
5. Investment Cost (M.Baht)	- Local Currency/Fund raising (M.Baht)	1,443	1,016	-	3,466	5,925
	- PEA's revenue (M.Baht)	481	339	-	1,155	1,975
	Total	1,924	1,355	-	4,621	7,900
6. Benefits	1) Increasing the stability and reliability of power system by reducing SAIFI and SAIDI equal to metropolis of other countries. 2) Providing electricity service in a density community adequately, effectively and safely according to the international standards. 3) Accommodating new technology used in development of an economic area in order to increase the growth of economic, reduce the outage cost, reduce the loss from power hazardous, and increase the competitiveness of Thailand. 4) Reducing problems and duration of power system operation and maintenance. 5) Accomplishing an aesthetic landscape of the project areas, and a harmless power system for life and property of customer in the density community.					
7. Person in Charge	System Planning Department (Project Planning Division)					
8. Status (September 2019)	Conducting the feasibility study					

Power System Reinforcement by Submarine Cable to Electrified Island Project						
1. Timeline	2018 - 2019					
2. Objectives	To develop power system in order to increase capacity and stability of power system electrified to islands which are major tourism locations with relatively high economic growth as well as reduce outage cost					
3. Implementation Area	1) Sri-chang Island, Chonburi Province 2) Sa-met Island, Rayong Province 3) Ko-kao Island, Phang-Nga Province 4) Phe-Phe-Don Island, Krabi Province					
4. Quantity of Work	Detail	Region				Total
		1	2	3	4	
	1) Submarine cable 120 sq.mm. and 240 sq.mm. (cct-km)	-	-	28.00	34.50	62.50
	2) Construct/Improve 22-33 kV Distribution system (cct-km)	-	-	12.00	23.00	35.00
	3) Capacitor (MVar)	-	-	2.10	12.00	14.10
	4) Automatic Voltage Regulator (AVR) (set)	-	-	-	1.00	1.00
	5) Ring Man Unit 22-33 kV (set)	-	-	4.00	4.00	8.00
	6) Recloser 22-33 kV (set)	-	-	-	1.00	1.00
5. Investment Cost (M.Baht)	- Local Currency/Fund raising (M.Baht)	-	-	625	998	1,623
	- PEA's revenue (M.Baht)	-	-	209	333	542
	Total	-	-	834	1,331	2,165
6. Benefits	1) Increasing the capacity and stability of power system on the islands to achieve the adequate and reliable supply. 2) Providing electricity service efficiently, reducing problems of power outage and voltage dip, and reducing losses in power system. 3) Reducing problems of power system operation and maintenance and supporting economic development especially tourism in accordance with government's policy					
7. Person in Charge	System Planning Department (Project Planning Division)					
8. Status (September 2019)	Conducting the IEE study					

Power System Efficiency Improvement Plan (Underground Cable Construction Long-term Plan)						
1. Timeline	2019 – 2023					
2. Objectives	<ul style="list-style-type: none"> <li>- To construct and improve power system.</li> <li>- To install equipment in order to increase stability and reliability of power system.</li> <li>- To reduce problems of operation, maintenance, and safety in municipal and tourism areas which local administration needs to improve a landscape.</li> </ul>					
3. Implementation Area	Countrywide					
4. Quantity of Work	Detail	Region				Total
		1	2	3	4	
	1) Construction of 22/33 KV Underground Cable System (cct. – km.)	29	17	4	23	73
	2) Construction of LV Underground Cable (cct.-km.)	58	34	8	46	146
5. Investment Cost (M.Baht)	- Local Currency/Fund raising (M.Baht)	1,524	878	180	1,167	3,749
	- PEA's revenue (M.Baht)	509	293	60	389	1,251
	Total	2,033	1,171	240	1,556	5,000
6. Benefits	<ol style="list-style-type: none"> <li>1) Increasing the stability and reliability of power system due to the reduction of SAIFI and SAIDI.</li> <li>2) Providing electricity service in a density community adequately, effectively and safely according to the international standards.</li> <li>3) Accommodating new technology used in development of an economic area in order to increase the growth of economic, reduce the outage cost, reduce the loss from power hazardous, and increase the competitiveness of Thailand</li> <li>4) Reducing problems and duration of power system operation and maintenance.</li> <li>5) Accomplishing an aesthetic landscape of the project areas, and a harmless power system for life and property of customer in the density community.</li> </ol>					
7. Person in Charge	System Planning Department (Project Planning Division)					
8. Status (September 2019)	7.32% of completion					

Geographic Information System Efficiency Improvement Plan		
1. Timeline	2021 – 2022	
2. Objectives	To expand the applying of Geographic Information System in management and operation in order to increase the efficiency of customer services, support smart grid management to household, and increase system stability and readiness in accordance with PEA's Strategic	
3. Implementation Area	Countrywide	
4. Quantity of Work	Detail	Total (System)
	1) Prepare information of residential area to be able to connect with HouseID via smart meter system for providing quick and convenient customer services	1
	2) Procure modern aerial photo and landbase information	1
	3) Improve/develop service system and power system analysis	1
	4) Improve the efficiency of computer master to support number of customers and technologies in the future	1
	5) Improve GIS to integrate with Smart Grid	1
	6) Improve/develop the connection to support a change of PEA systems	1
5. Investment Cost (M.Baht)	- Local Currency/Fund raising (M.Baht)	1,005
	- PEA's revenue (M.Baht)	335
	Total	1,340
6. Benefits	1) Increasing the potential of GIS in order to provide a quick and convenient service 2) Accomplishing modern aerial photo and landbase information corresponded to using requirement 3) Providing ready-to-use system in order to serve the increasing users from PEA employees and customers 4) Supporting the smart grid development in order to manage electric energy in transmission system throughout household 5) Supporting information of location to increase the potential of PEA Systems	
7. Person in Charge	System Planning Department (Power System Geo-Informatics Division)	
8. Status (September 2019)	Gathering comments from related government organizations for proposing to the cabinet	

New Rural Household Electrification Project, 2 <sup>nd</sup> Stage						
1. Timeline	2018 - 2023					
2. Objectives	To extend distribution system to new household in accordance with government's policy					
3. Implementation Area	Countrywide					
4. Quantity of Work	Detail	Region				Total
		1	2	3	4	
	1) Number of Household (household)	41,184	66,343	9,260	25,173	141,960
	2) MV (cct.-km..)	1,148	1,830	118	454	3,550
	3) LV (cct.-km..)	3,579	13,559	831	3,251	21,220
4) Distribution transformer (kVA)	28,010	91,150	21,230	16,140	156,530	
5. Investment Cost (M.Baht)	- Local Currency/Fund raising (M.Baht)	1,217	2,576	377	753	4,923
	- PEA's revenue (M.Baht)	406	859	126	251	1,642
	Total	1,623	3,435	503	1,004	6,565
6. Benefits	<p>1) Supporting government's policy and Ministry of Interior's strategy in public utility service by extending electricity service to countrywide household</p> <p>2) Increasing productivity, supporting business and industry in rural area, and reducing the fuel cost leading to the growth of economic, an increase of local employment, reduction of revenue inequality, and an expansion of economic to regional and rural area.</p> <p>3) Improving the quality of life and reducing the migration to major cities.</p> <p>4) Perceiving that people are always taken care of by the government</p>					
7. Person in Charge	System Planning Department (Project Planning Division)					
8. Status (September 2019)	11.25 % of completion					

Power System Development on Islands Project						
1. Timeline	2019 – 2021					
2. Objectives	To develop power system in order to increase the capacity and stability of electrification and serve the increasing demand of islands which are major tourism locations with relatively high economic growth					
3. Implementation Area	Central Area 2 (Chonburi and Chanthaburi Provinces) Southern Area 1 (Ranong Province) Southern Area 2 (Suratthani, Phuket, Phang-Nga, Krabi Provinces) Southern Area 3 (Satoon Province)					
4. Quantity of Work	Detail	Region				Total
		1	2	3	4	
	1) Submarine Cable (cct.-km..)	-	-	4.30	172.60	176.90
	2) High Voltage Distribution System (cct.-km.)	-	-	8.00	71.15	79.15
	3) Distribution Transformer 33/0.4 kV (kVA)	-	-	-	3,720	3,720
	4) Distribution Transformer 22/0.4 kV (kVA)	-	-	370	-	370
5) Low Voltage Distribution system (cct.-km..)	-	-	3.50	61.20	64.70	
5. Investment Cost (M.Baht)	- Local Currency/Fund raising (M.Baht)	-	-	147	4,826	4,973
	- PEA's revenue (M.Baht)	-	-	49	1,608	1,657
	Total	-	-	196	6,434	6,630
6. Benefits	1) Increasing the capacity and stability of power system on islands 2) Providing electricity service efficiently and reducing the problems of outage and voltage dip as well as losses in power system 3) Reducing problems of power system operation and maintenance 4) Reducing the fuel cost of diesel generator power plant and small diesel of consumer 5) Supporting the economic development especially tourism in accordance with government's policy					
7. Person in Charge	System Planning Department (Project Planning Division)					
8. Status (September 2019)	Conducting the feasibility study					



Smart Grid Development Project, 1 <sup>th</sup> stage								
1. Timeline	2020 – 2022							
2. Objectives	To expand and develop the infrastructure of the Smart Grid							
3. Implementation Area	The municipality, according to Smart City Development Plan of government, in 4 regions of Thailand and the installation area of Very Small Power Producer (VSPP).							
4. Quantity of Work	Detail	Region					Head Office	Total
		1	2	3	4			
	1) Smart Meter System							
	- Smart Meter (Unit)	188,000	208,000	220,000	123,000	-	739,000	
	- Mile&Backhaul Communication System (system)	1	1	1	1		4	
	- Data concentrator system (system)	-	-	-	-	1	1	
	- Data management system (system)	-	-	-	-	1	1	
	- Network management system (system)	-	-	-	-	1	1	
	- Link information technology system (system)	-	-	1	-	-	1	
	2) Energy Management System							
	- HEMS/BEMS/ Direct Load Control system (system)	-	-	1	-	1	2	
	- Demand Respond Management System (system)	2	2	2	2	-	8	
	3) Automatic Distribution system (system)	14	14	14	14	-	56	
	- Substation Automation (Substation)							
	- Installation of remote control equipment (Fast switching type) (set)	-	1	-	-	-	1	
	- Power supplied management system from VSPP (system)							
5. Investment Cost (M.Baht)	- Local Currency/Fund raising (M.Baht)	852	885	1,297	595	1,341	4,970	
	- PEA's revenue (M.Baht)	285	295	433	199	448	1,660	
	Total	1,137	1,180	1,730	794	1,789	6,630	
6. Benefits	1) Reducing the expense of traditional meter reading. 2) Reducing the losses of revenues due to Non-Technical and Technical Losses. 3) Increasing the customers' trust in meter reading and being able to monitor and manage customer energy consumption efficiently 4) Increasing the efficiency of planning, management and maintenance of power system as well as the connection with VSPP 5) Increasing the reliability of power system since distribution automation system is able to limit the power failure to the minimal section 6) Increasing the reliability and quality of power system							
7. Person in Charge	System Planning Department (Smart Grid Planning Division)							
8. Status (September 2019)	Conducting the feasibility study							

Renewable Energy Generation Development Project on Kut Island and Mak Island, Trat Province						
1. Timeline	2018 - 2020					
2. Objectives	<ul style="list-style-type: none"> <li>- To develop power generation model efficiently in order to provide electricity to rural islands which lack of power supply.</li> <li>- To reduce the investment cost for managing peak demand</li> <li>- To be an electrification model of microgrid solution</li> <li>- To support an increase of renewable energy in accordance with government's policy</li> </ul>					
3. Implementation Area	Kut and Mak Islands, Trat Province					
4. Quantity of Work	Detail	Region				Total
		1	2	3	4	
	1) Installation of PV (set)	-	-	2	-	2
	2) Installation of Hydro Power Plant (set)	-	-	1	-	1
	3) Installation of BESS (set)	-	-	1	-	1
4) Installation of Microgrid Controller	-	-	1	-	1	
5. Investment Cost (M.Baht)	- Local Currency/Fund raising (M.Baht)	-	-	241	-	241
	- PEA's revenue (M.Baht)	-	-	81	-	81
	Total	-	-	322	-	322
6. Benefits	<ul style="list-style-type: none"> <li>1) Promoting power generation from solar and hydro power</li> <li>2) Reducing the generation cost from diesel generator in rural islands</li> <li>3) Reducing greenhouse gas emission which leads to global warming</li> </ul>					
7. Person in Charge	System Planning Department (Project Planning Division)					
8. Status (September 2019)	Relevant agencies have commented to change the operation area which is currently being Micro grid on the Paluay Island area.					

Advanced Metering Infrastructure (AMI) for Large Customers Project							
1. Timeline	2018 – 2023						
2. Objectives	To expand and install AMI for large customers to cover countrywide						
3. Implementation Area	According to the number of large customers which have not yet installed AMI in 4 regional PEA Service area						
4. Quantity of Work	Detail	Region					Total
		1	2	3	4	Head Office	
	1) Install TOU smart Meter (set) - 3 Phases 3 Wires - 3 Phases 4 Wires	16,200	13,500	38,000	18,300	-	86,000
	2) Communication device and Accessories (set)	16,200	13,500	38,000	18,300	-	86,000
	3) Installation of computer system (system)					1	1
5. Investment Cost (M.Baht)	- Local Currency/Fund raising (M.Baht)	248	225	587	282	270	1,612
	- PEA's revenue (M.Baht)	33	75	196	94	90	538
	Total	331	300	783	376	360	2,150
6. Benefits	1) Reducing the expense of reading meters 2) Reducing the loss of revenue due to Non-Technical and Technical Loss 3) Increasing the customers' trust in reading meters and being able to monitor and manage customer energy consumption efficiently 4) Increasing the power system reliability since distribution automation is able to limit the outage to the minimal section. 5) Monitoring and analyzing the characteristic of customers' energy consumption 6) Increasing the reliability and quality of PEA Power Grid						
7. Person in Charge	System Planning Department (Smart Grid Planning Division)						
8. Status (September 2019)	Proposing to related government organizations in order to gather comments for proposing to the cabinet						

Micro Hydro Power Plant for Community Project						
1. Timeline	2018 – 2021					
2. Objectives	To procure an energy source for rural area which lacks of power supply as well as to be a model of microgrid in the future					
3. Implementation Area	Northern Area					
4. Quantity of Work	Detail	Region				Total
		1	2	3	4	
	Construction of mini hydro power plant (plant)	3	-	-	-	3
5. Investment Cost (M.Baht)	- Local Currency/Fund raising (M.Baht)	225	-	-	-	225
	- PEA's revenue (M.Baht)	75	-	-	-	75
	Total	300	-	-	-	300
6. Benefits	1) Providing electricity service in rural area and reducing losses in distribution system 2) Reducing fuel cost diesel generator 3) Developing microgrid to support smart grid technology in the future					
7. Person in Charge	System Planning Department (Project Planning Division)					
8. Status (September 2019)	Conducting the feasibility study					

Microgrid Development Plan, 1 <sup>st</sup> Stage							
1. Timeline	2018 - 2022						
2. Objectives	To expand and develop power system with microgrid in rural area						
3. Implementation Area	- Mueang and Mae-Sariang District in Mae Hong Son Province - 3 Southern border provinces and 4 districts in Songkla province.						
4. Quantity of Work	Detail	Region					Total
		1	2	3	4	ส่วนกลาง	
	1) Improve microgrid system in Mae Sariang (system)	1	-	-	-	-	1
	2) Improve microgrid system in accordance with EGAT's microgrid in Mueang Mae Hong Son Province (system)	1	-	-	-	-	1
	3) Installation of Microgrid in 3 southern border provinces and 4 districts in Songkla province (system)	-	-	-	1	-	1
5. Investment Cost (M.Baht)	- Local Currency/Fund raising (M.Baht)	531	-	-	294	-	825
	- PEA's revenue (M.Baht)	177	-	-	98	-	275
	Total	708	-	-	392	-	1,100
6. Benefits	1) Increasing the reliability and quality of power system 2) Delaying in investing of transmission and submarine cable to rural areas and islands 3) Reducing losses in distribution system 4) Reducing the use of fossil fuel 5) Maintaining reliability in electrifying to important customers 6) Increasing the efficiency of reliable and efficient system management responding to customer demand more efficiently that leads to delay in construction of power plant 7) Reducing investment of control system when connecting with traditional control system by IEC61850 standard 8) Being able to manage energy consumption in house/building by customers efficiently and supporting the management of energy consumption for limiting the energy use in peak time or abnormal event.						
7. Person in Charge	System Planning Department (Smart Grid Planning Division)						
8. Status (September 2019)	Conducting the feasibility study						