

Key Success Factors for Pipeline Projects in Thailand

(including a Regional lookahead)

IPLOCA

53rd Annual Convention
Bangkok 2019

JOINT PRESENTERS

Ekachai Yimsakul
Vice President
PTT Public Co., Ltd.

Robert Avery
Managing Director
Brightstar Asia Ltd.





Sustainable Growth for All

PTT is a Thai state-owned, publicly listed oil and energy company with the largest market capitalization on the Stock Exchange of Thailand.

PTT has developed and operates an extensive network of high pressure pipelines in Thailand mostly for the transmission of domestically produced and imported Natural Gas for power generation, industrial and NGV use.

- > 4,000 km pipelines in operation (Onshore & Offshore)
- > 500 km pipelines under construction
- > 300 km pipelines under study

PTT operates its pipelines through 10 onshore regional centres and one offshore operations centre in Chonburi.



Intelligent Engineering – for better

Brightstar was established in the UK in 2012 and expanded to Asia in 2016.

Brightstar provide optimised designs for energy transportation, storage and distribution systems, tailored closely to our clients needs.

Brightstar and our affiliate *Asia Pipelines* have been involved in the engineering of all recent major pipeline projects in Thailand.

We have particular expertise in Gas transmission and Oil Product pipeline systems.

Brightstar also has extensive experience of Aviation Fuel supply systems around the world.

Key Success Factors for Pipeline Projects in Thailand

An Owner's Perspective

Ekachai Yimsakul - PTT



Pipeline Map Offshore

First Transmission Pipeline
now already

38 years

since **1981**

3 Main Offshore
Transmission Pipelines

Total approximately

2,240 km

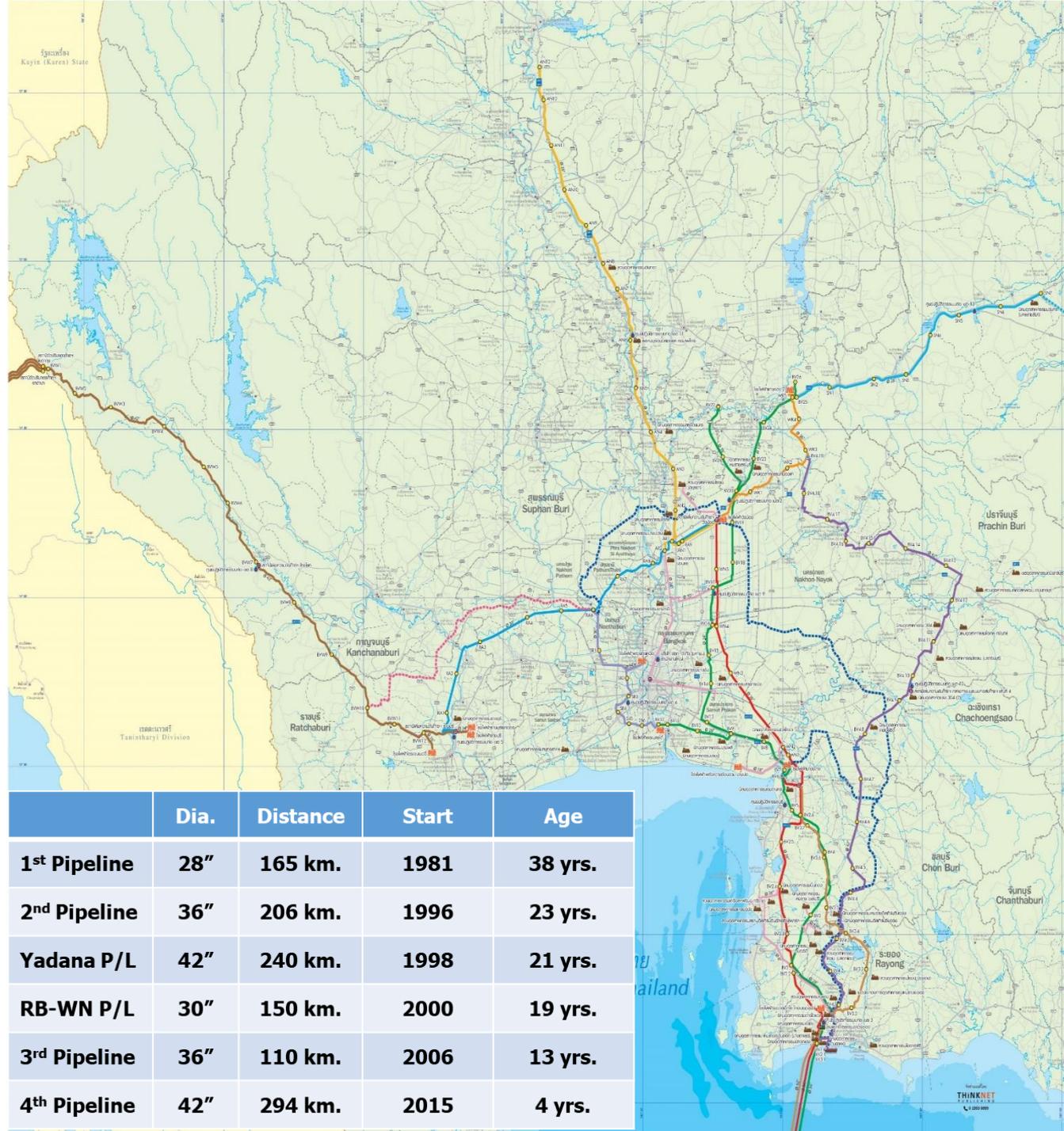
Pipeline Map Onshore

LNG terminal built

2011

Total approximately

1,978 km



	Dia.	Distance	Start	Age
1st Pipeline	28"	165 km.	1981	38 yrs.
2nd Pipeline	36"	206 km.	1996	23 yrs.
Yadana P/L	42"	240 km.	1998	21 yrs.
RB-WN P/L	30"	150 km.	2000	19 yrs.
3rd Pipeline	36"	110 km.	2006	13 yrs.
4th Pipeline	42"	294 km.	2015	4 yrs.

What **SUCCESS** means ?

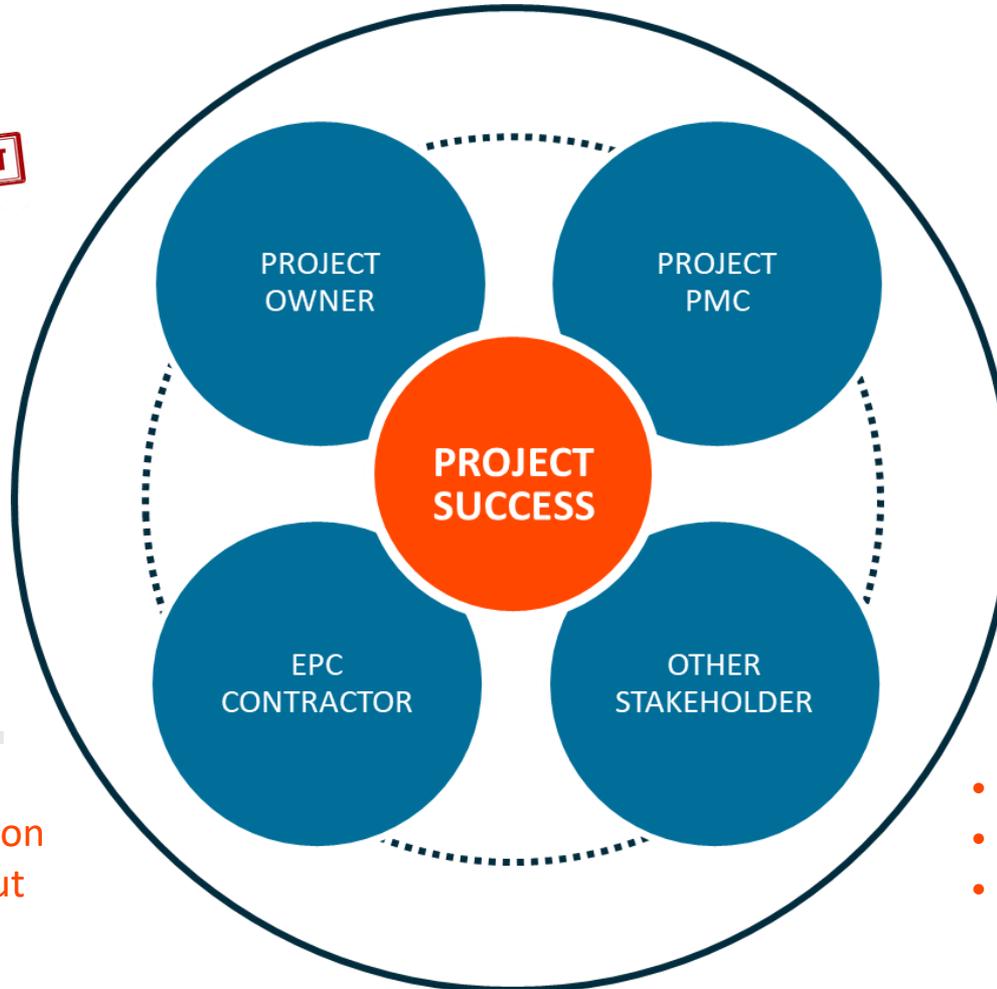
- Subjective and Dynamic
- Depending on perspective of each stakeholder



- No Delay
- Satisfied Quality
- Non-Disputed Contract Closeout



- Satisfied Quality
- High HSE Standard



- 
- 
- Maximized Profit
 - Maintain Reputation
 - Successful Closeout

- Maximize Local Content
- EIA Compliance
- Minimize Impact (Community, Landowner)

BALANCING OF INDIVIDUAL INTEREST

THEORY

REALITY

Manage



Budget



Schedule



Quality & Safety



Satisfaction of Stakeholder



Measure Results

ONE of the most important

Understand
culture

Rule &
Regulations

**Nature of Country and
Owner Requirements**
Where Project Located



Internal

Process

External

Business Plan

PDP / Gas Plan
Project Feasibility



EPPO

Project Engineering

Engineering Design
Construction
Project Management



PMC
EPC

Environmental

EIA / Safety



ONEP

Land Acquisition

Pipeline ROW
Land Permit



ERC



Landowner

Community Relations

Public Consultation



Stakeholder

Government Relations

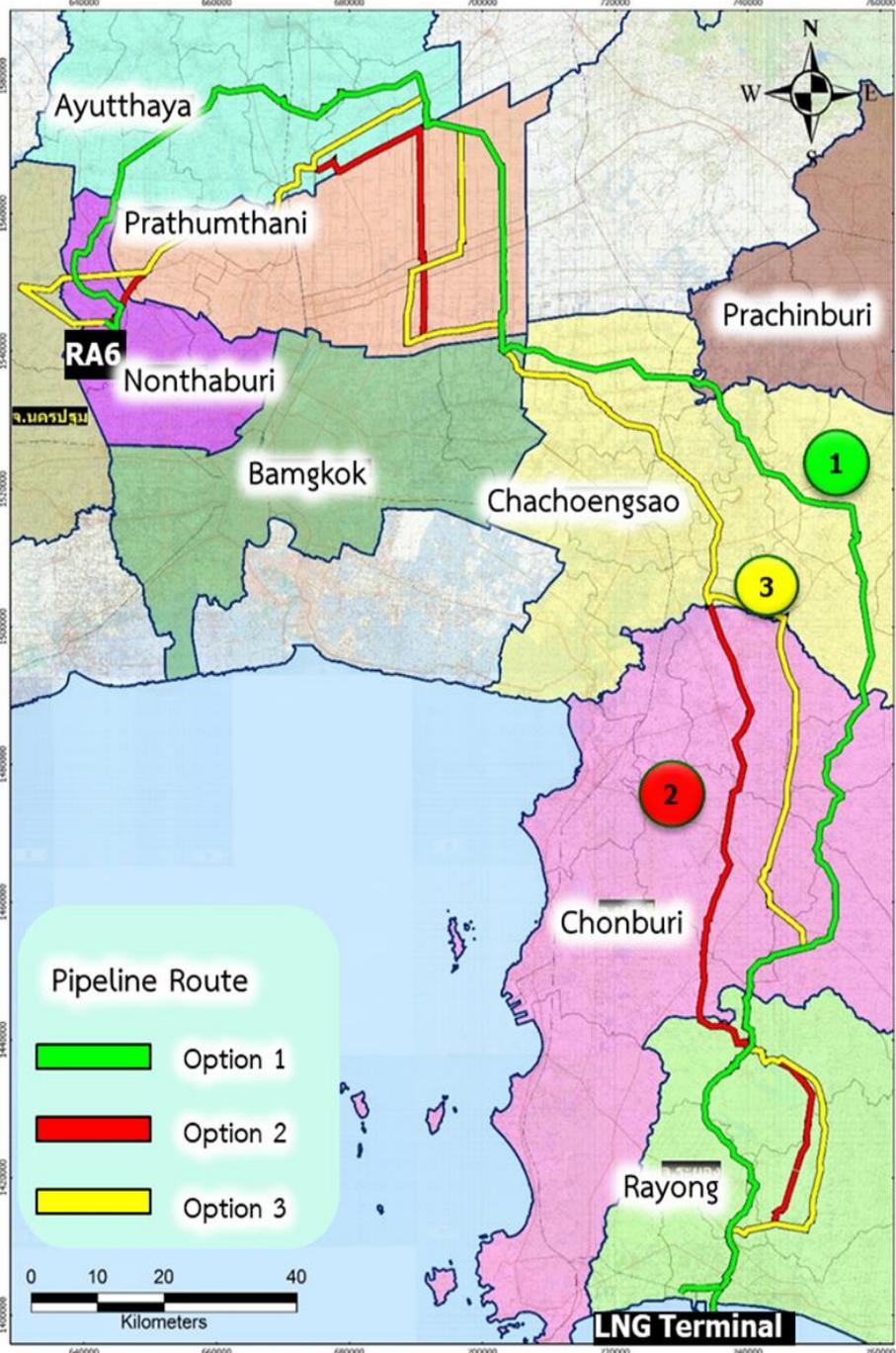
Consensus / Permit



Authority

Route Selection

Weighting and Scoring of relevant aspects



	Score	Option 1	Option 2	Option 3
Impact on Community/Social	20	18.18	10.24	6.52
Impact on Environment	35	32.02	24.33	15.05
Impact on Health/ Safety	15	12.71	11.64	9.07
Engineering/ Construction	15	13.05	7.90	11.54
Economy/ Investment	15	12.65	11.60	10.73
TOTALSCORE	100	88.61	65.71	52.91

Engineering/ Construction

- ROW available for Construction/Operations
- Distance from existing pipelines/Utilities
- Constructability

Economy/ Investment

- Construction Cost
- ROW acquisition Cost
- Potential for Future Development/ Market Expansion



“to regulate energy industry operation (the electricity industry, the natural gas industry and the energy network industry)”

ERC ROW Authority Process

Approval of the proposed notification on demarcation of exploration zone (appended with a map or a layout of land).

Approval of Pipeline Route (demarcation of the area for the Energy Network System Area).

Determination of Compensation for Land and Construction, Crop and other properties on Land.



Land Acquisition Process

Survey and Select the best Route.

1

Submit letter to Landowner and marking on site

2

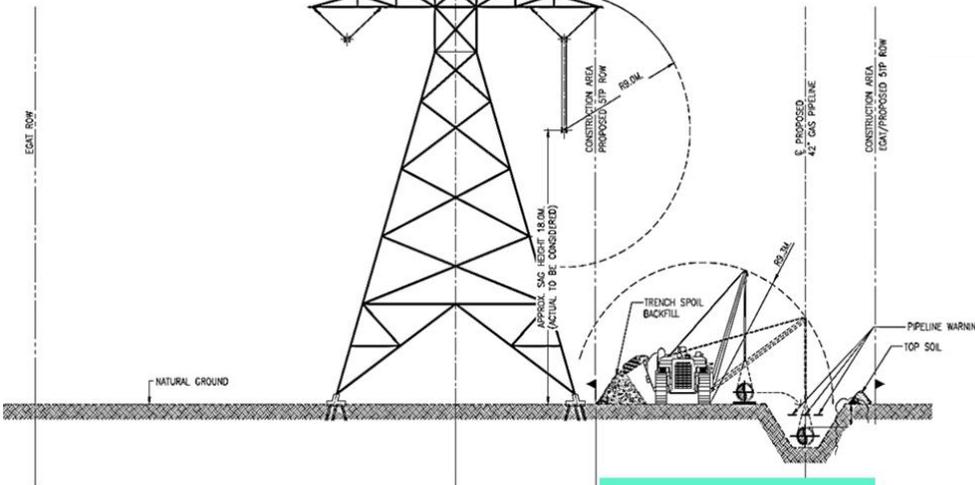
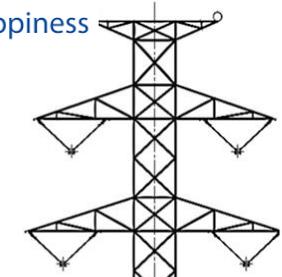
Complete the Payment for Compensation

3

Submit letter to Landowner for commencement of Construction

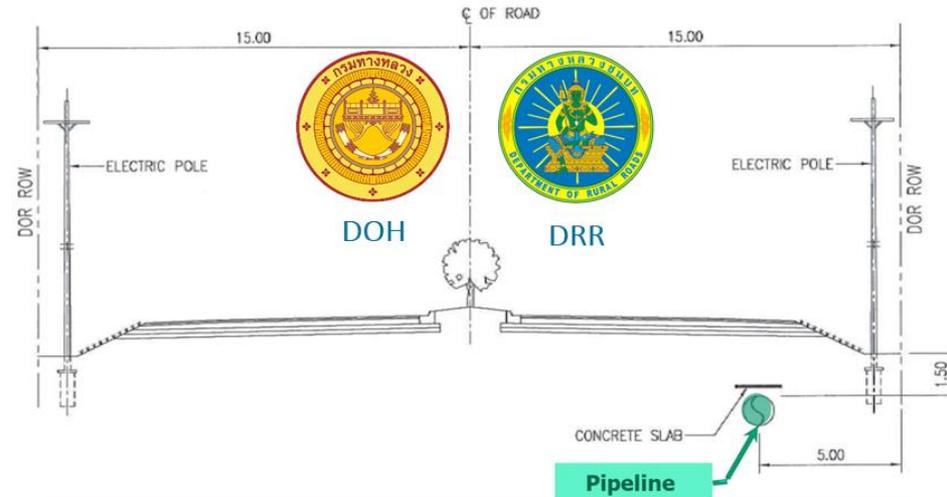
4

Nature of Pipeline ROW

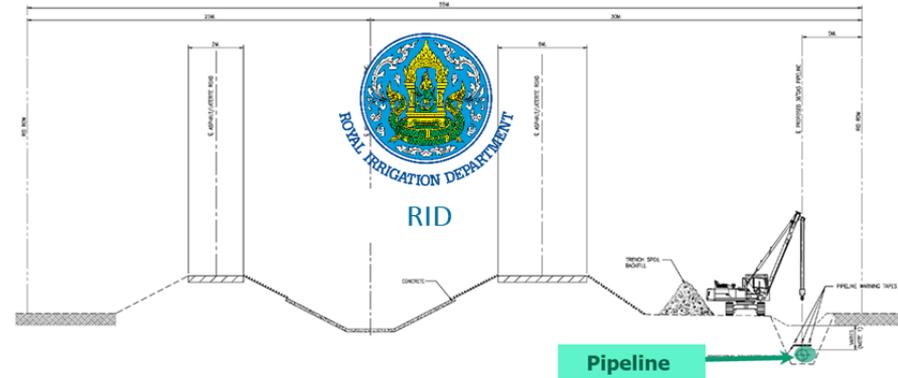


Pipeline ROW

High Voltage Transmission Line ROW



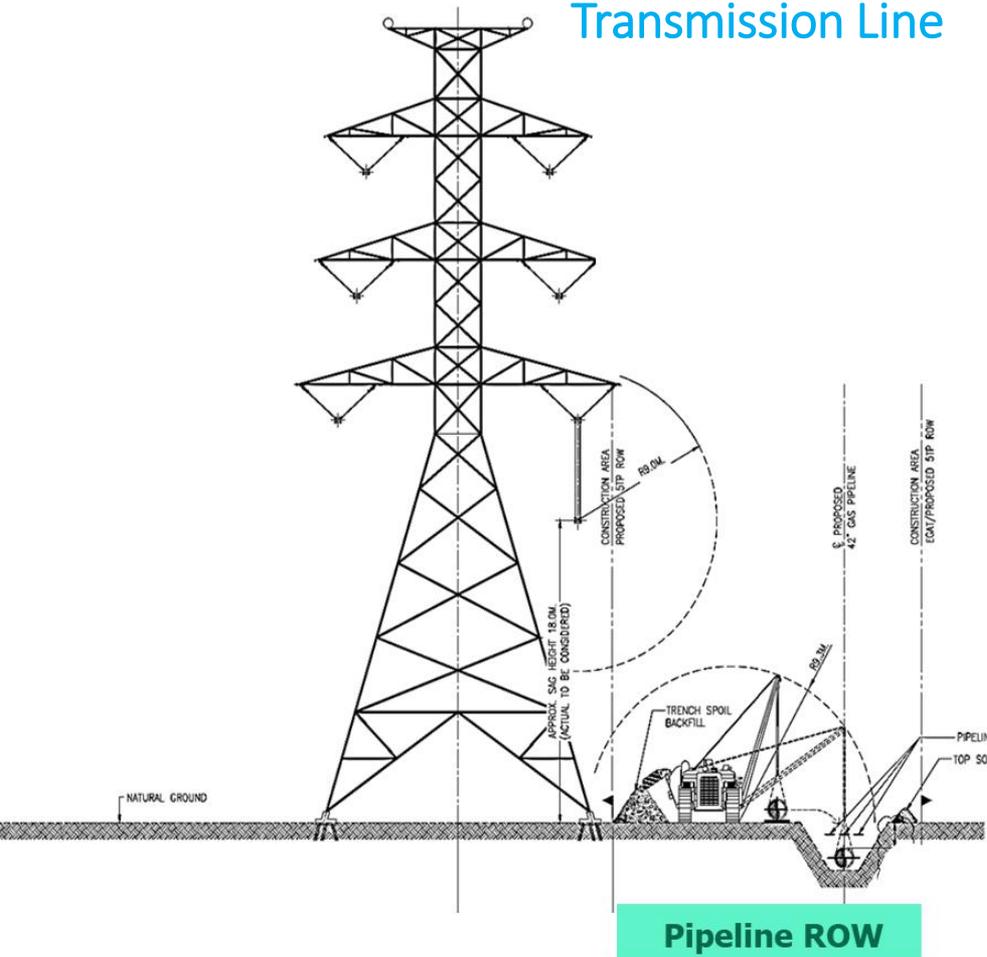
Highway/ Road ROW



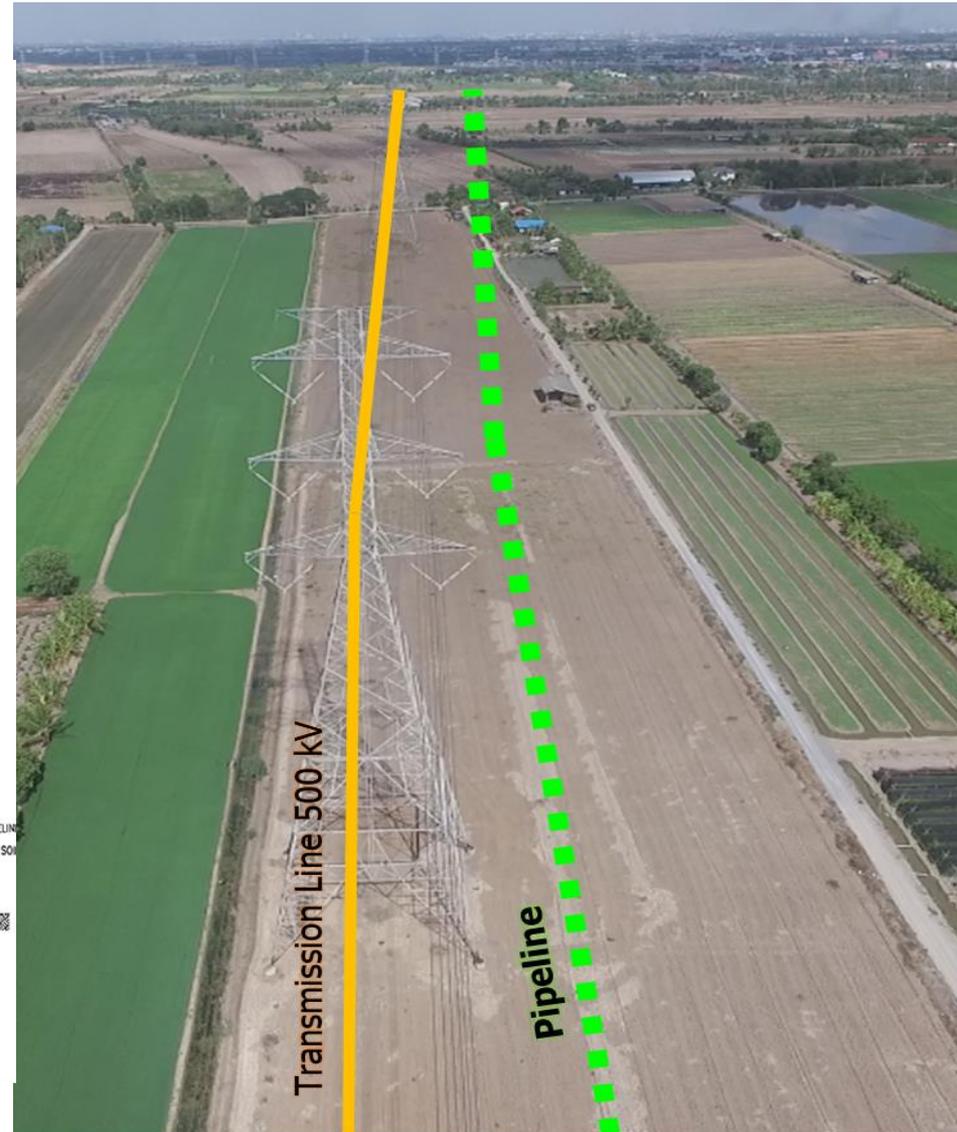
Waterway ROW

EGAT ROW

Maximize Use of
Existing Utility ROW:
Transmission Line

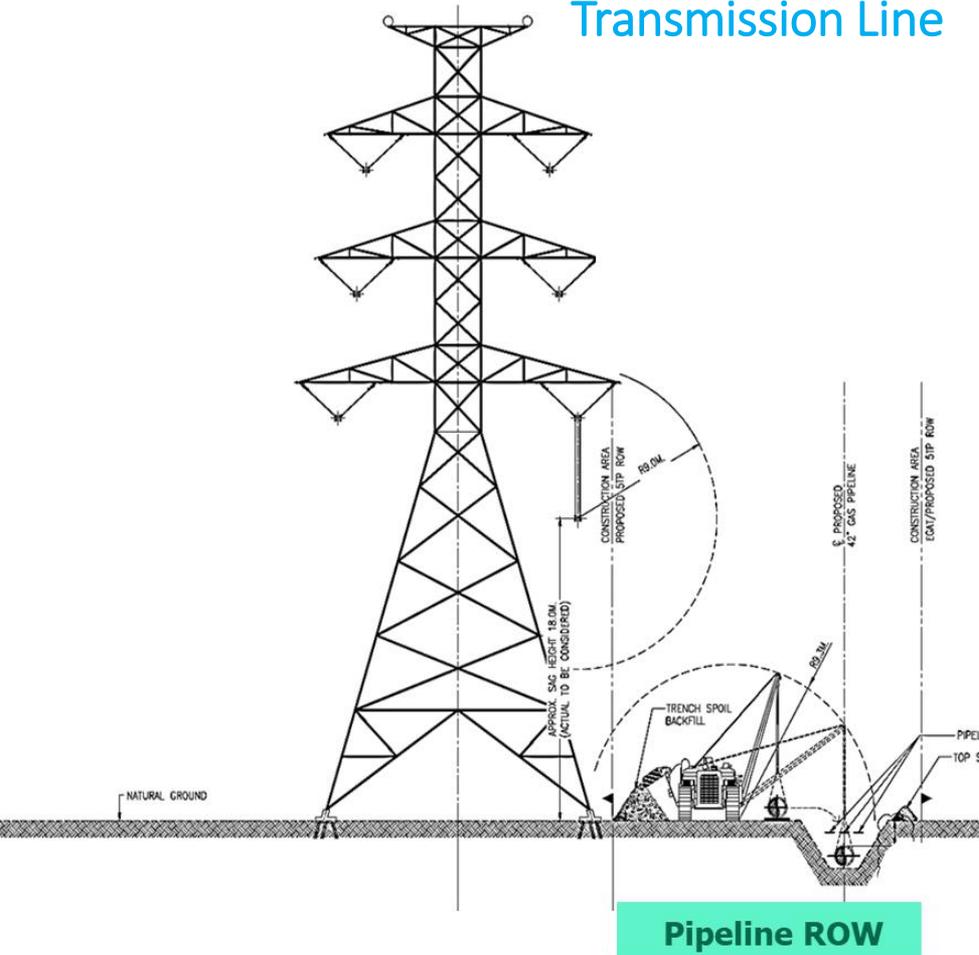


High Voltage Transmission Line ROW

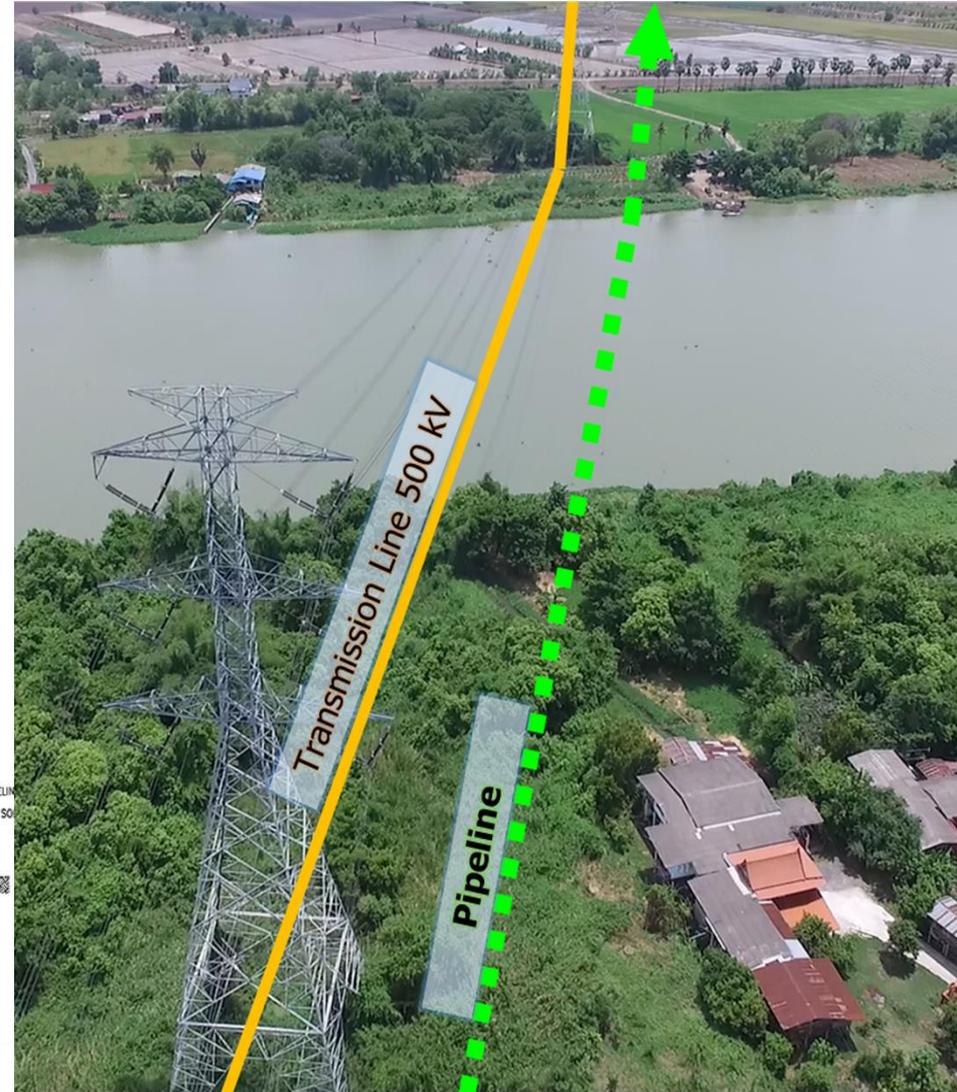


EGAT ROW

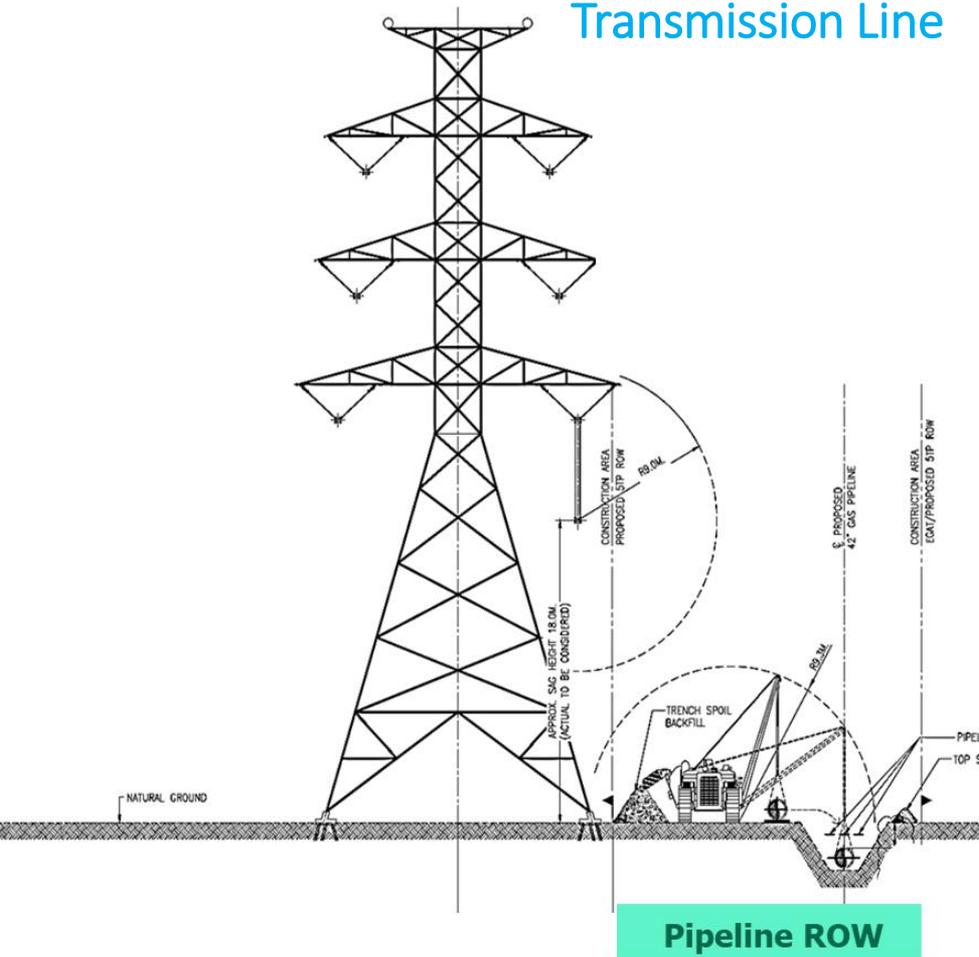
Maximize Use of
Existing Utility ROW:
Transmission Line



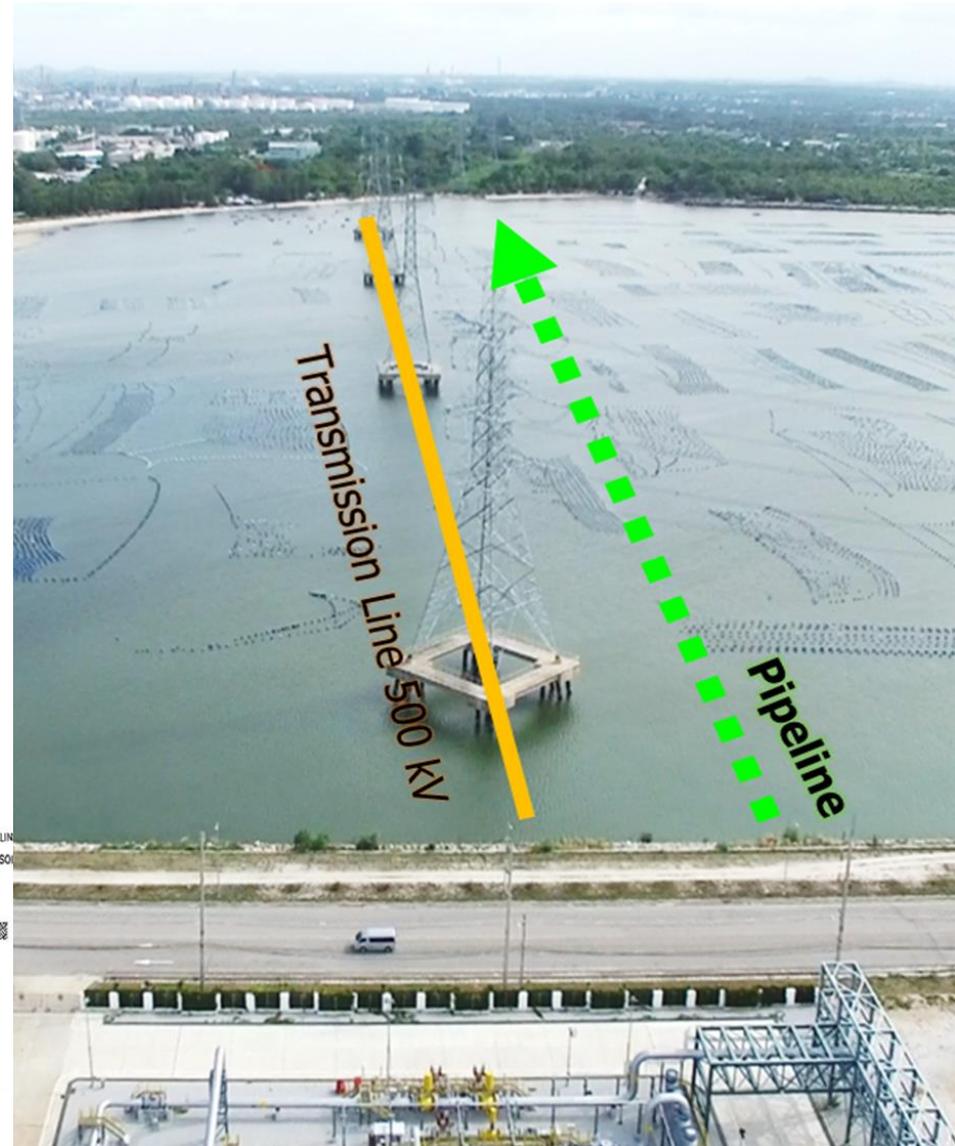
High Voltage Transmission Line ROW



Maximize Use of
Existing Utility ROW:
Transmission Line



High Voltage Transmission Line ROW



Highway ROW

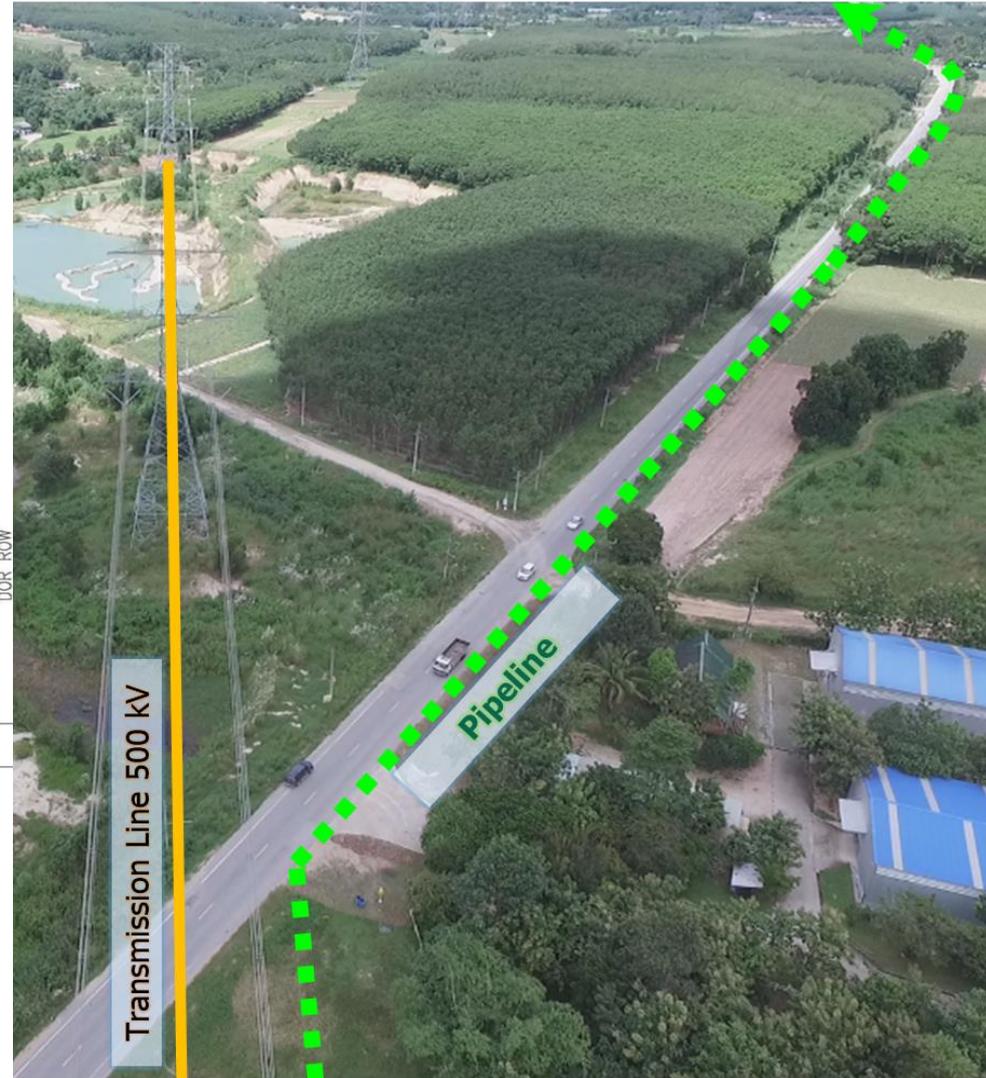
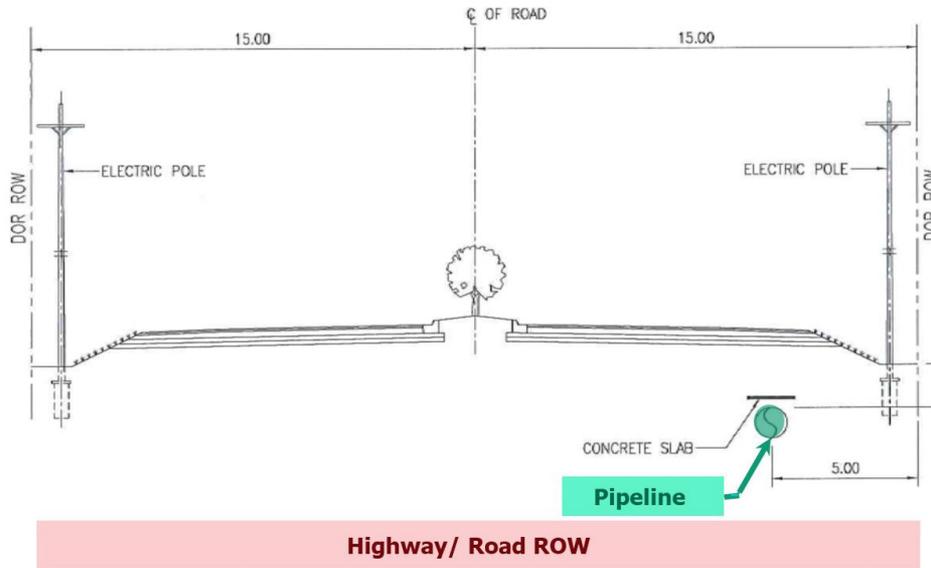


DOH



DRR

Maximize Use of Existing
Utility ROW: Highway,
Road



Highway ROW

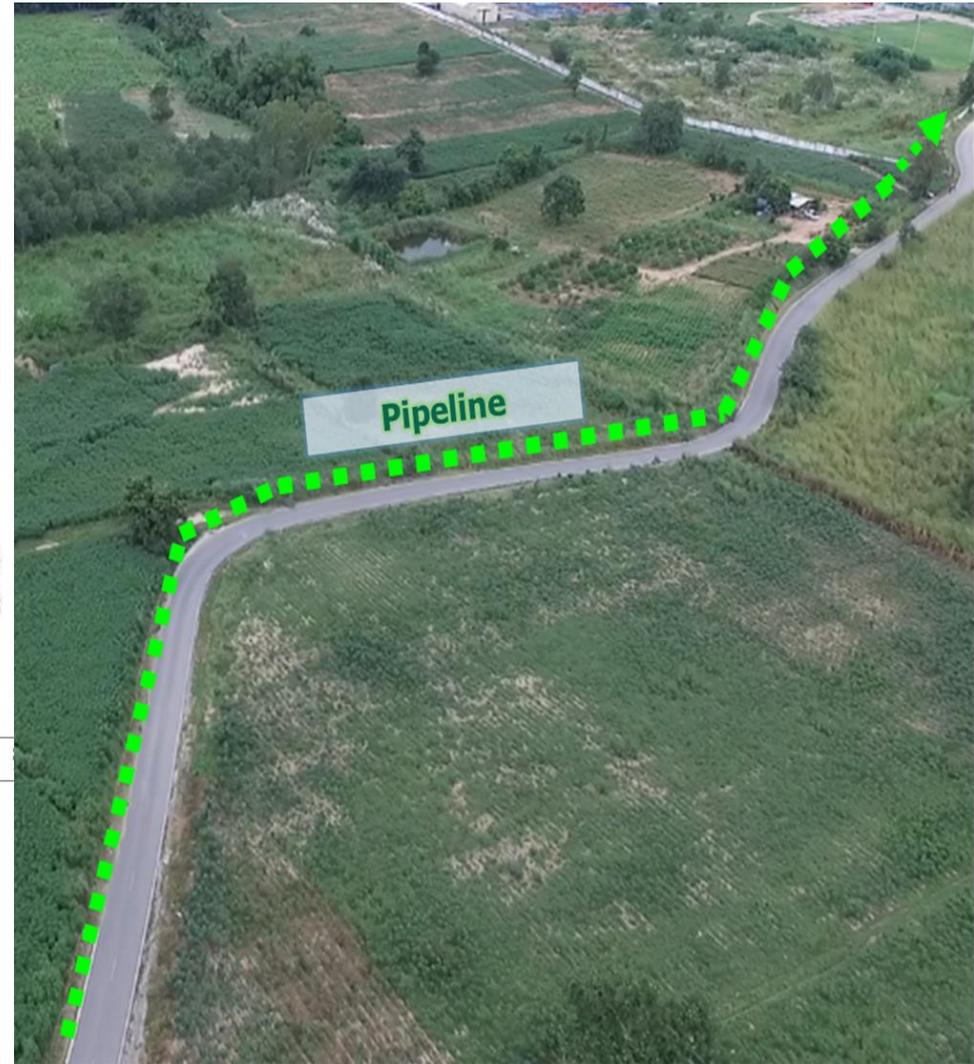
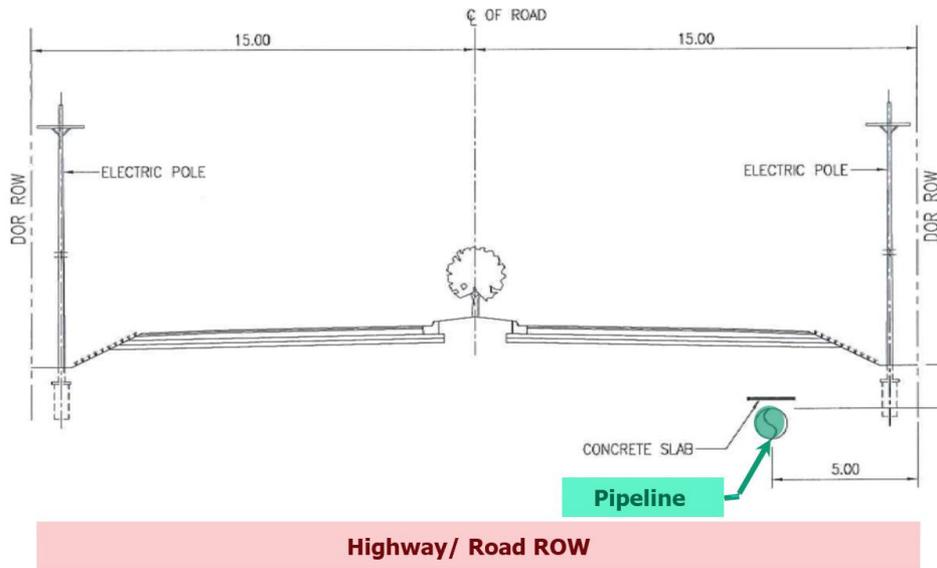


DOH



DRR

Maximize Use of Existing
Utility ROW: Highway,
Road



Highway ROW

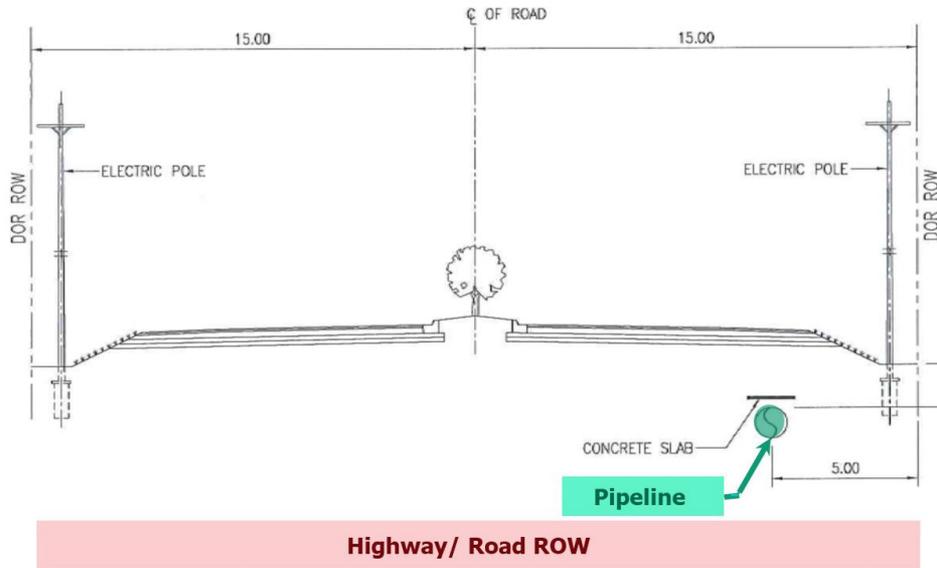


DOH



DRR

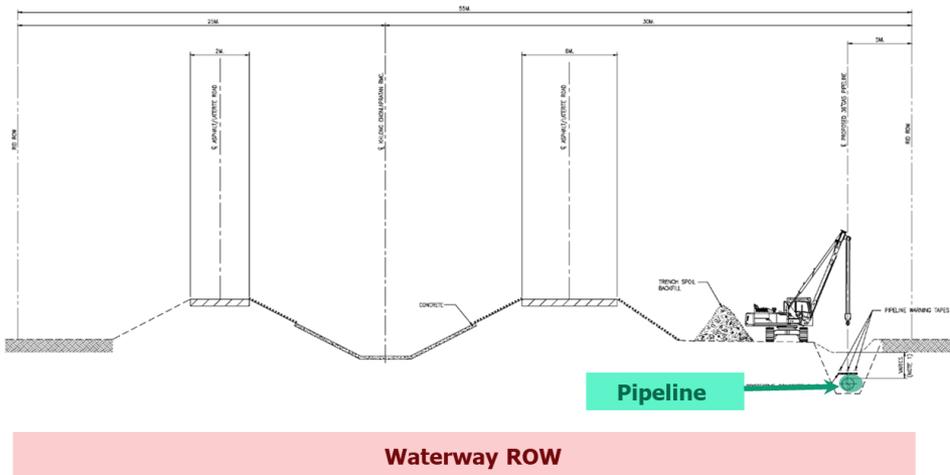
Maximize Use of Existing
Utility ROW: Highway,
Road



Waterway ROW



Maximize Use of Existing
Utility ROW: **Waterway**

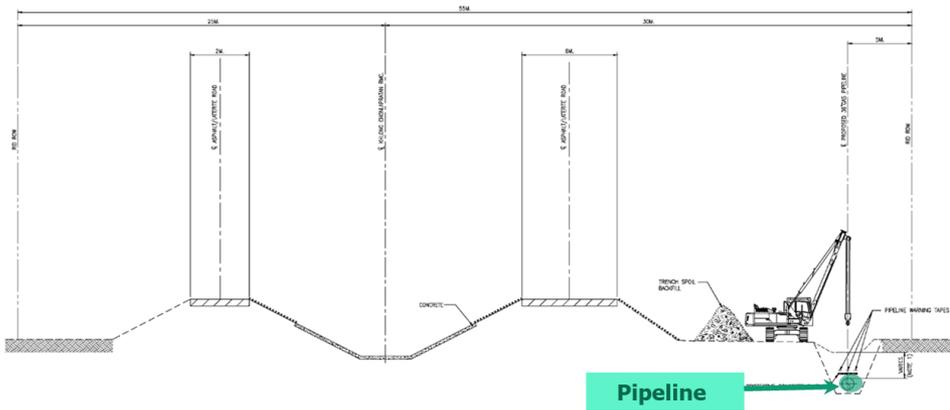


Waterway ROW



RID

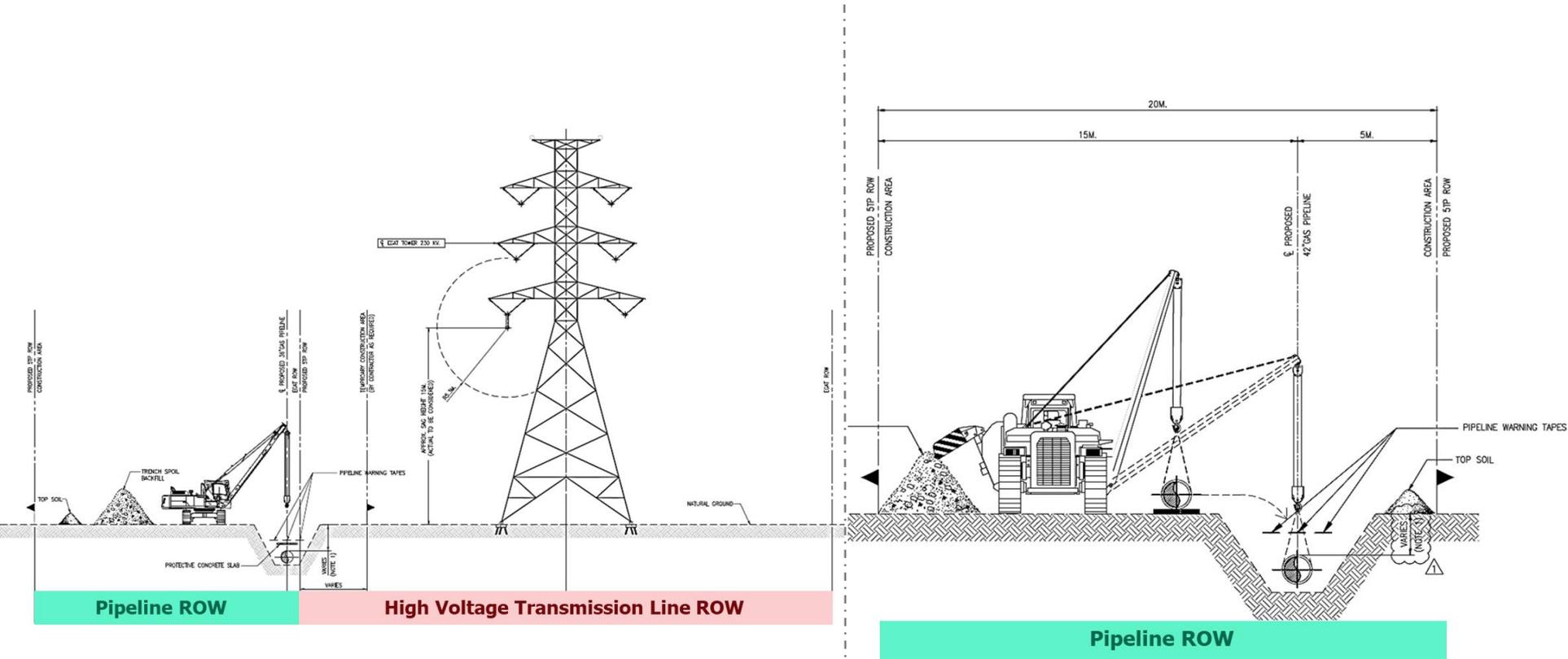
Maximize Use of Existing
Utility ROW: **Waterway**



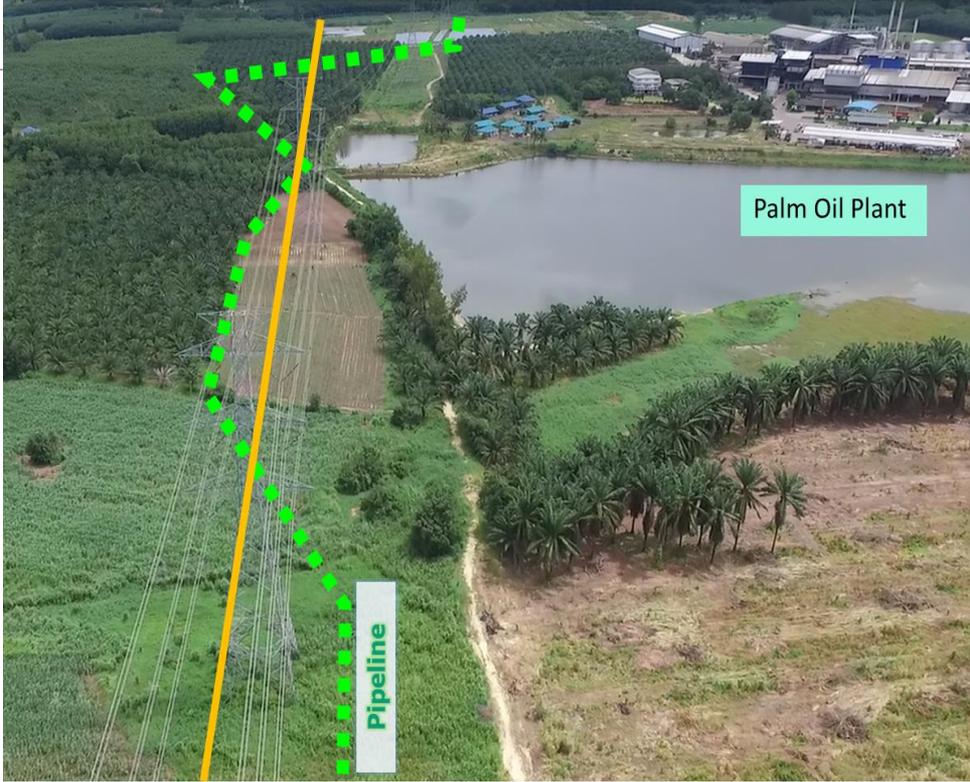
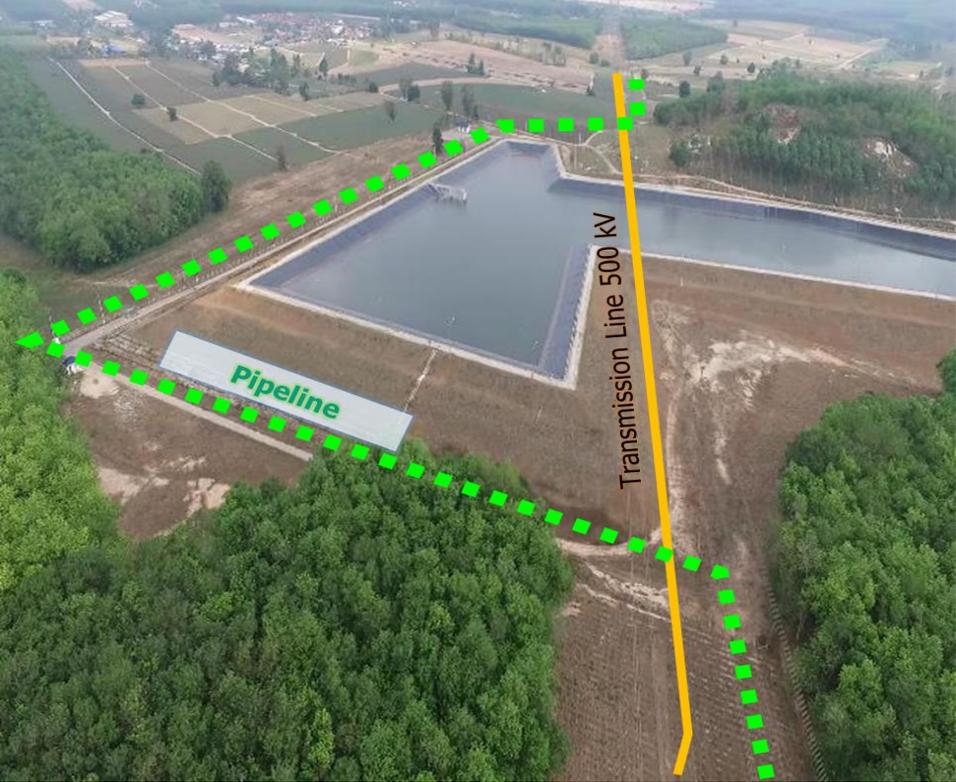
Waterway ROW



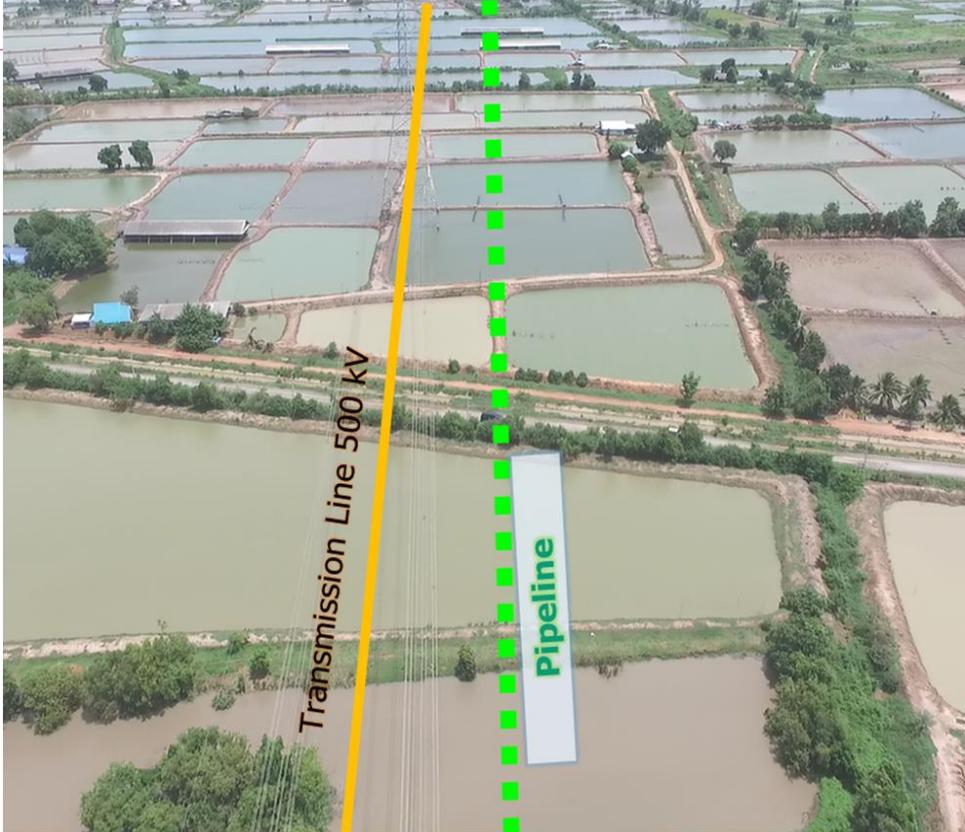
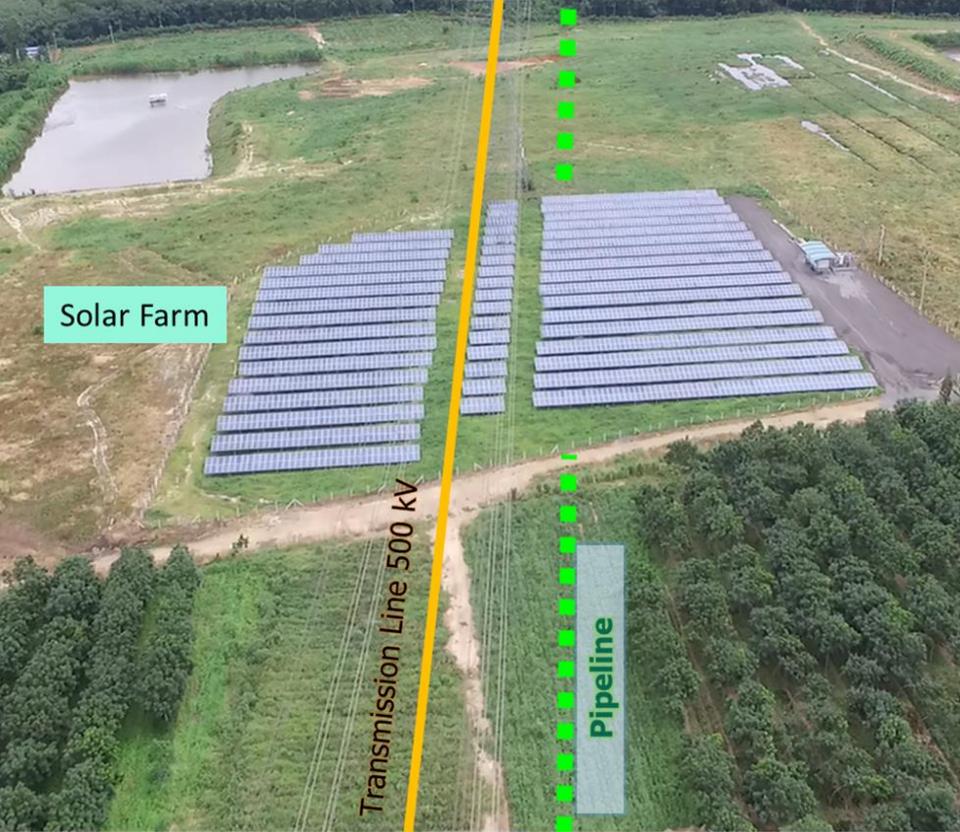
Avoid Private Own Land unless....



Consideration...



Consideration...



Consideration...



Ideal



Actual

Contractual Requirements regarding Pipeline ROW

requirement based on

2

reasons



New Technology

benefits with higher investment



Feedback

EPC, PMC, Authorities
landowner our lesson learn

Advance Notification



LEF



construction



LRF

Area released for construction

20-30

 km
released land for construction

compensations



PTT
ROW



LAND
OWNER



fish pond construction method



Summary

- Well defined Project Requirements – Strategic Planning
- Regulations - allow plenty of time for consultation process
- Optimum Route Selection – Experience
- Clear Expectations from EPC – a good PMC can help
- Close collaboration during execution – common objectives

Regional Lookahead – Major Pipeline Projects

- Thailand
- Mainland SE Asia

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Current Projects

EPC

5th Transmission Pipeline (5TP)

Gas Transmission (Onshore)

Phase 1

Maptaphut to BV-5.8 / Bang Pakong

Diameter: 42 inch / 36 inch

Length: 145km / 60km

Contractor: Sinopec

Progress: >70%

Phase 2

BV-5.8 to RA#6 Mixing Station

Diameter: 42 inch

Length: 200km

Contractor: KSS

Progress: >40%

Thailand



5TH Transmission Pipeline (5TP)

5TP Project Stats



Total Length

Ph 1 42"/36" 205km

Ph 2 42" 200km



HDDs

Ph 1 21 No./16km

Ph 2 59 No./29km



Bores

Ph 1 204 No.

Ph 2 142 No.



Block Valve Stations

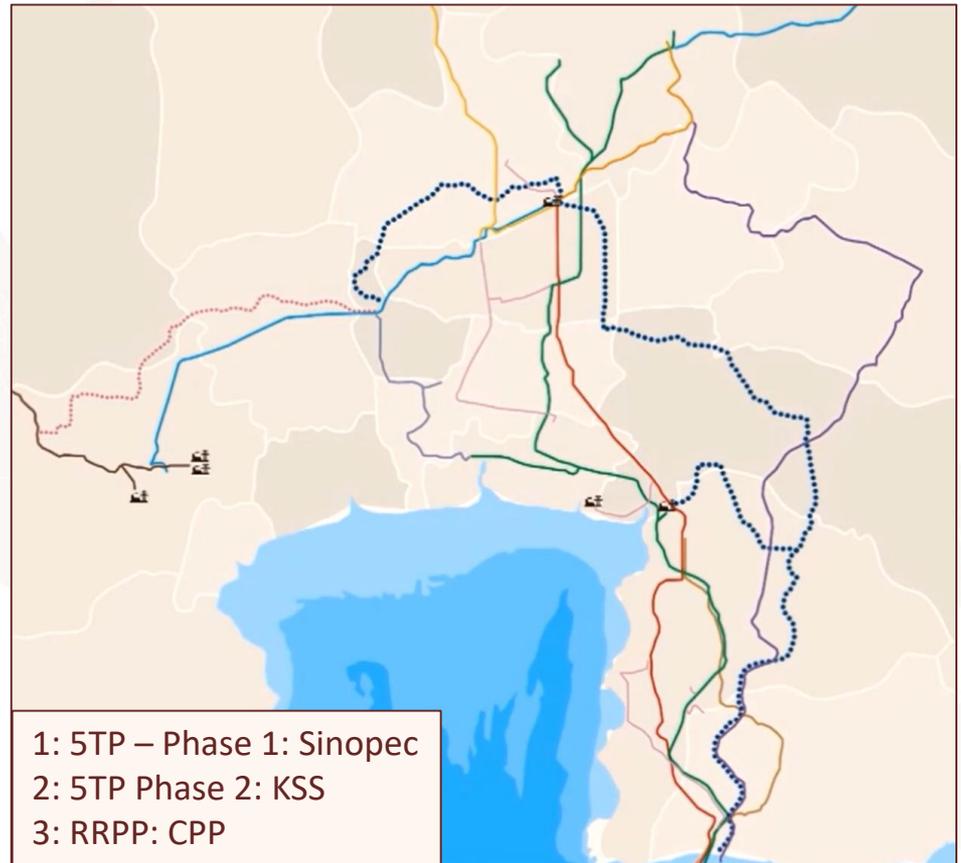
Ph 1 11 No.

Ph 2 12 No.



Facilities

Gas Dispatch Facility,
Mixing Station, PRMS,
Tie-ins



Current Projects

EPC

Oil Pipeline Extension to Northe East (OPENE)

Oil Products (Onshore)

Saraburi to Khon Kaen

Diameter: 16 inch

Length: 340km

Contractor: CPP

Progress: >15%

OPENE Extension

Khon Kaen to Vientienne (Laos)

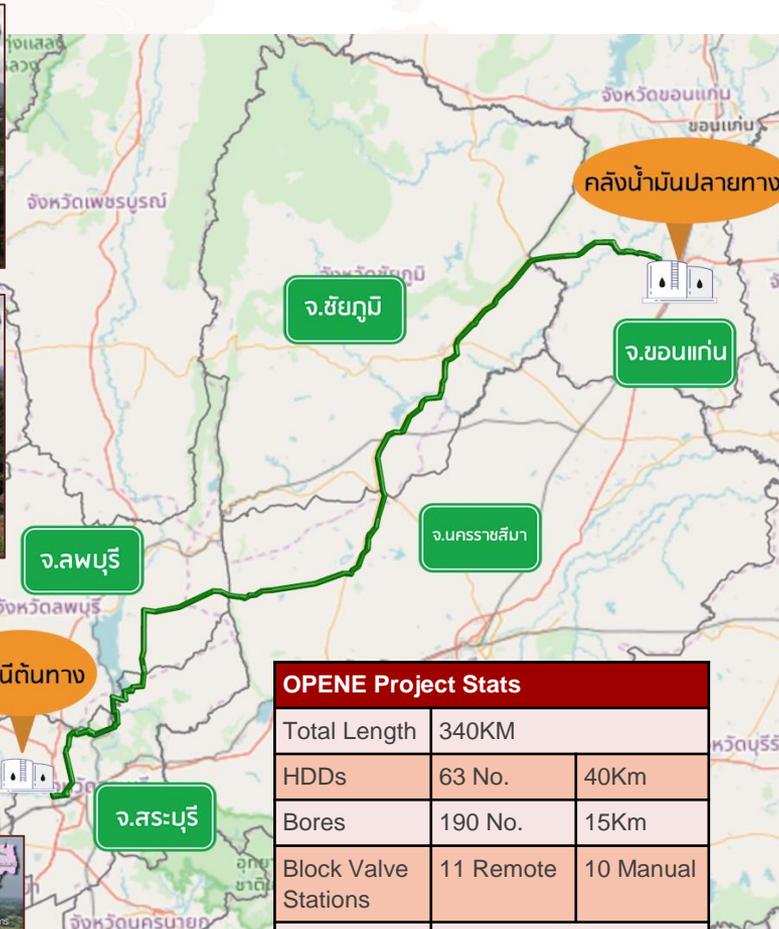
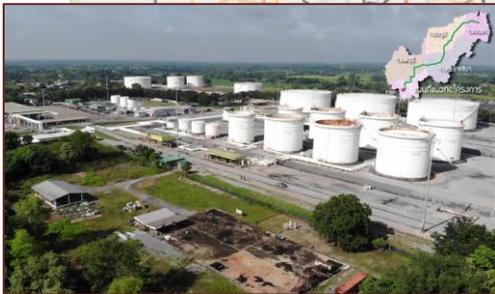
Diameter: 14 inch (est.)

Length: 180km (est.)

Thailand



Oil Pipeline Extension to North East (OPENE)



OPENE Project Stats		
Total Length	340KM	
HDDs	63 No.	40Km
Bores	190 No.	15Km
Block Valve Stations	11 Remote	10 Manual
Facilities	New Pump Station at existing Saraburi Oil Terminal	
	New 130,000 m ³ Oil Storage & Distribution Terminal at Khon Kaen	

ระยะทางโดยประมาณ
342 กม.



Current Projects Tendering

PGU-I Upgrade

Gas Transmission (Onshore)

Gas Processing, Kertih to
M1 Station, Kijal
(Replacement)

Diameter: 36 inch

Length: 30km

Status: Tenders under
Evaluation

PGU-II

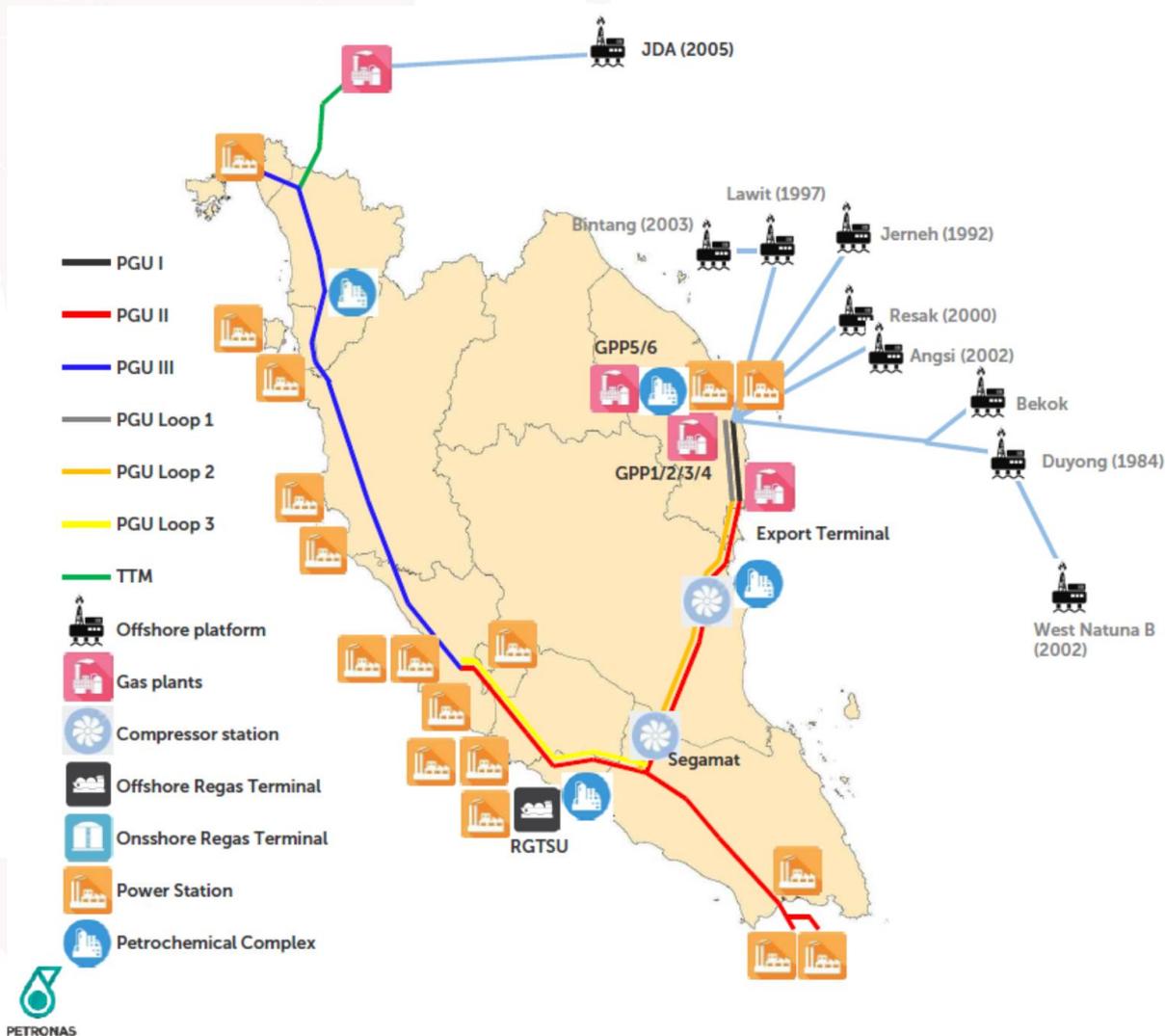
Replacement

Diameter/Length TBA

Malaysia



PGU-1 Upgrade (Graphite)



Current Projects

FEED

EGAT FSRU-SBK Pipeline

Gas Import / Transmission
(Onshore / Offshore)

South Bangkok Power Plant

Diameter: 30 inch

Length: 20km (offshore)

40km (onshore)

Status: EPC Tender 2019

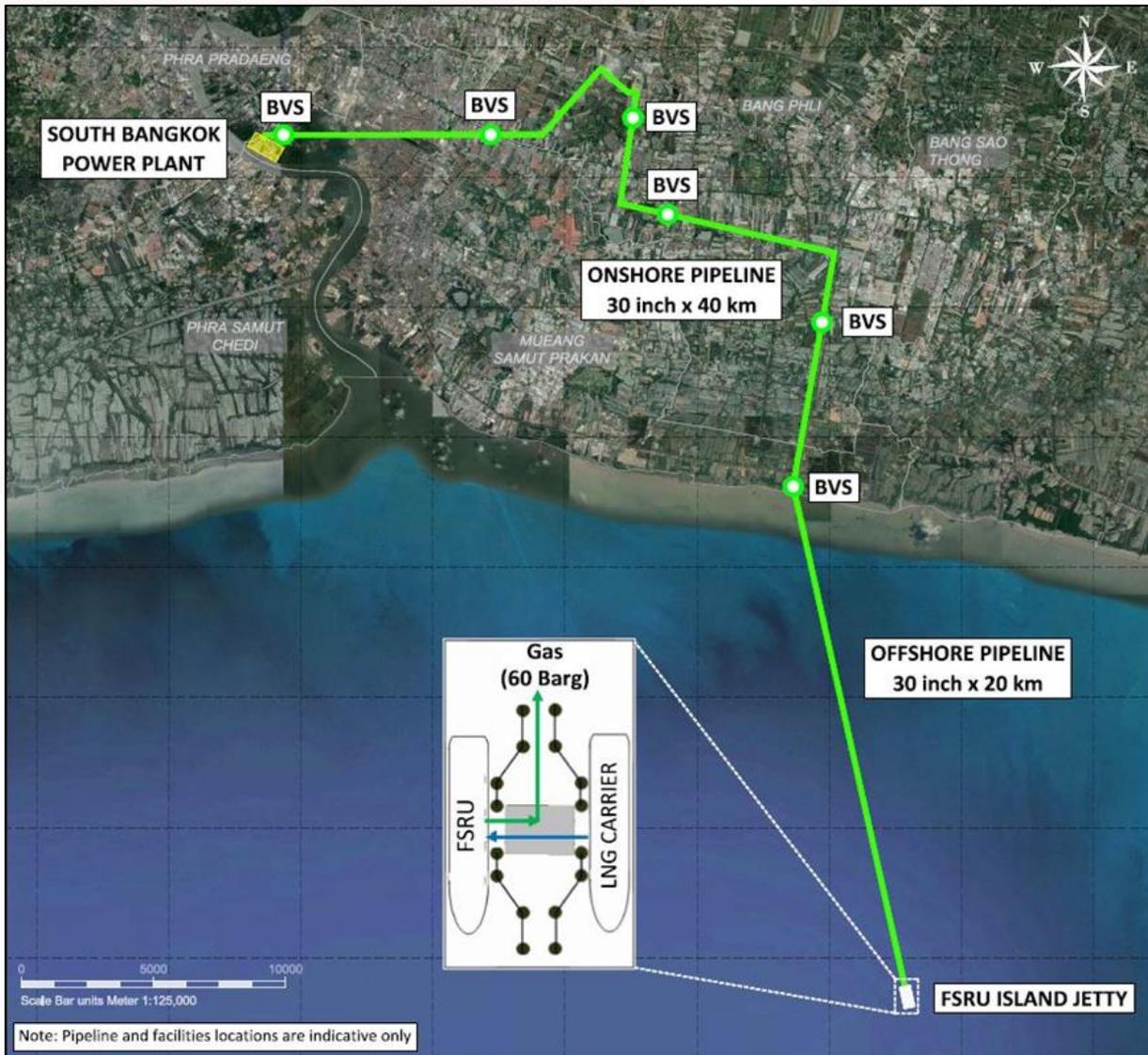
Pkg 1: FSRU 210,000m³

Pkg 2: Mooring, Pipelines
& Facilities

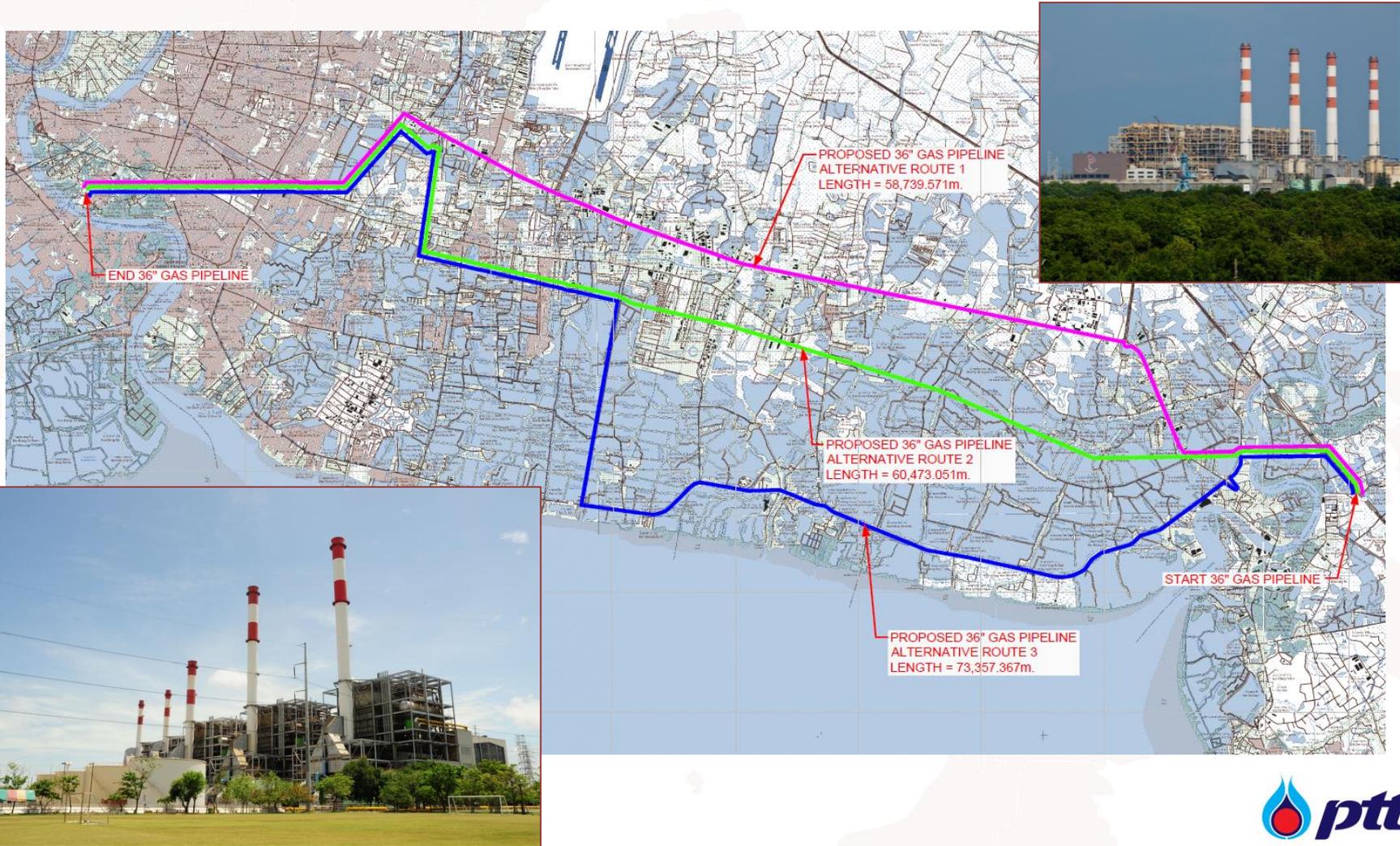
Thailand



EGAT FSRU-SBK Pipeline



BPK SBK Pipeline



Current Projects

FEED

SPP Oil Pipeline, Cambodia

Oil Products
(Onshore)

Sihanoukville Import
Terminal to Phnom Penh
Distribution Depot

Diameter: 14 inch

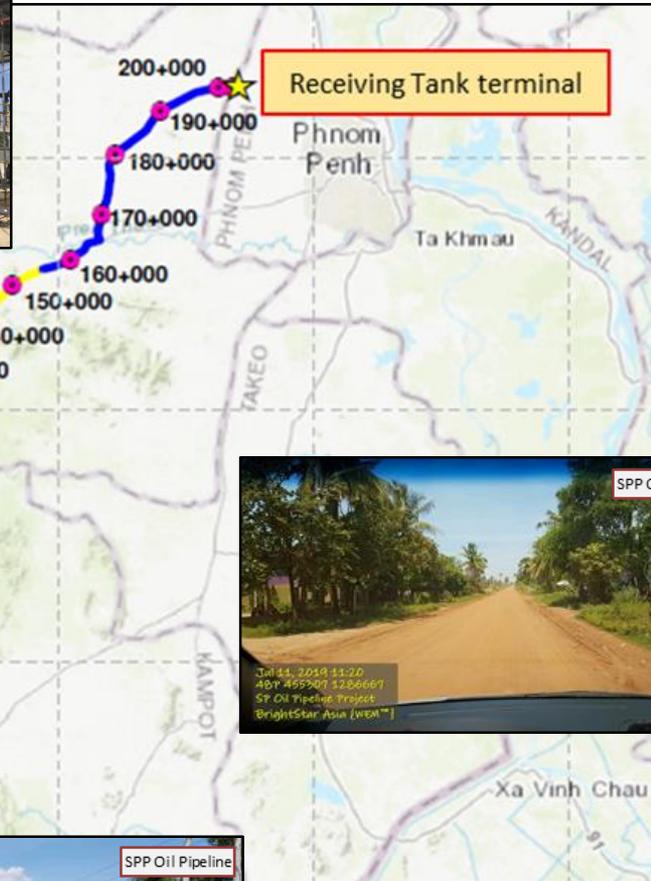
Length: 210km

Status: FEED ongoing

EPC Tender - Q3 2020



Sihanoukville to Phnom Penh Oil Pipeline



Current Projects

Pending

Ca Voi Xanh (“Blue Whale”) Project

Field Development, Gas Treatment and Power Generation

Offshore: 85km

Diameter: 36 inch (Gas)
6 inch (Cond.)

Onshore: 13km

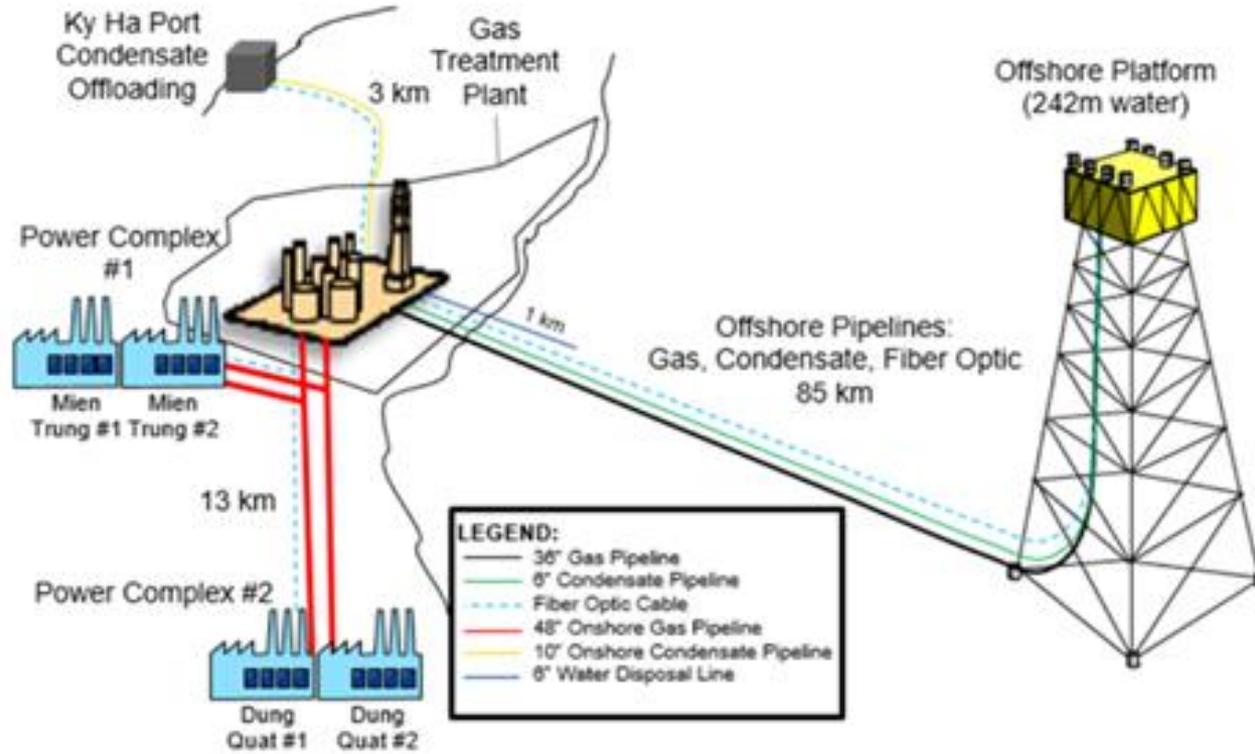
Diameter: 2 x 36 inch (Gas)

Status: Pending
clarification of territorial claims

Vietnam



Ca Voi Xanh (“Blue Whale”)



Future Projects Study

Thailand:

- (1) Khanom LNG
- (2) Ranong LNG
- (3) Isan Pipeline
- (4) OPENE Extension
- (5) NFPT Extension

Malaysia:

- (6) MPP (North)
- (7) MPP (South)

Myanmar:

- (8) Yangon to Mandalay Oil Pipeline
- (9) Kanbauk to Yangon Pipeline Rehabilitation
- (10) Dawei Landbridge

Vietnam:

- (11) Block B - Omon Pipeline



Major Pipeline Projects - Mainland SE Asia

Country	Project Name	From	To	Diameter	Length	On/Offshore	Purpose	Status	Owner	Contractor
Thailand	5th Transmission Pipeline (5TP) Ph1	Maptaphut	BV-5.8	42"	150 km	Onshore	Gas Transmission	EPC	PTT	Sinopec
		BV-5.6	BP4 Bang Pakong	36"	50 km					
	5th Transmission Pipeline (5TP) Ph2	BV-5.8	RA#6 Mixing Station	42"	200 km	Onshore	Gas Transmission	EPC	PTT	KSS
	RA#6-Ratchaburi Pipeline (RRPP)	BV-10	RA#6	30"	120 km	Onshore	Gas Transmission	EPC	PTT	CPP
	SBK Pipeline	Bang Pakong	South Bangkok Power Plant	36" (e)	70 km	Onshore	Gas Transmission	Study	PTT	Worley
	Khanom LNG	Khanom (F)SRU	Surat Thani Power Plant	30" (e)	90 km (e)	Onshore	Gas Transmission	Study	PTT	Worley
	Ranong LNG	Ranong FSRU	Surat Thani Power Plant	30" (e)	150 km (e)	Onshore	Gas Transmission	Study	PTT	Worley
	'Isan' Pipeline	Nakhon Ratchasima	Nam Phong Power Plant	28" (e)	200 km	Onshore	Gas Transmission	Study	PTT	-
	EGAT FSRU	Upper Gulf FSRU	South Bangkok Power Plant	28" (e)	20 km	Offshore	Gas Import/ Transmission	FEED EPC Tender: 2019 Q4	EGAT	Fluor
			40 km		Onshore					
	OPENE	Saraburi	Khon Kaen	16"	340 km	Onshore	Oil Products	EPC	TPN	CPP
	OPENE Extension	Khon Kaen	Nong Khai/ Vientienne (Laos)	14" (e)	180 km (e)	Onshore	Oil Products	Study	TPN	-
NFPT	Ayutthaya	Phichit	14"-12"	370 km	Onshore	Oil Products	Commissioning	FPT	Strega/ CPP	
	Kampaeng Phet	Lampang		200 km			Construction			
NFPT Extension	Tak	Mae Sot / Myawaddy	10" (e)	70 km (e)	Onshore	Oil Products	Study	FPT	-	
Cambodia	-	Sihanoukville	Phnom Penh	14"	210 km	Onshore	Oil Products	FEED EPC Tender 2020 Q3	TBA	TBA
Malaysia	PGU-I Upgrade ("Graphite")	Gas Processing Kertih	M1 Station, Kijal	36"	30 km Replacement	Onshore	Gas Transmission	EPC Tendering	Petronas	-
	PGU-II Upgrade	Kalong	Segamat	36" (e)	220 km (e) Replacement	Onshore	Gas Transmission	FEED EPC Tender: 2019 Q3	Petronas	-
	MPP (North)	Melaka	Jitra	18"-12" (e)	600 km	Onshore	Oil Products	EPC Suspended	TBA	-
	MPP (South)	Pengerang	Melaka	16" (e)	370 km					
Myanmar	-	Yangon	Mandalay	14"-12" (e)	600 km	Onshore	Oil Products	Study	TBA	-
	-	Kanbauk	Yangon	20"	50 km (e) Replacement	Onshore	Gas Transmission	Study	PTTEP	-
	Dawei Land Bridge	Dawei Port	Petchaburi (Thailand)	2 x 48"	240 km (e)	Onshore	Crude Oil	Study	Dawei SEZ	-
Vietnam	Omon Pipeline	Block B	Omon	28"	380 km	Onshore	Gas Transmission	EPC Tender suspended	BPOC	-

Thank you

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