National Interconnection Ecosystem Lab (NIEL)

Report
30 July 2021

BACKGROUND: National Interconnection Ecosystem Lab (NIEL)

The NIEL focus:

- To chart out a **strategic plan for the development of DC, IXP and IC**.
- To deliver a **strategic plan which includes recommendations and policies in making Malaysia competitive in the region whilst addressing the internet experience between EM and PM.**

Lab Facilitators

- To **assist** in providing guidance/framework to the workshop members and leaders
- To **challenge** the current ideas – to achieve Big Results Fast
- To **assist** in refining the detailed implementation plans
- To **assist** in shaping and translating ideas into concrete action plans

Lab Members

- Provide **insights and knowledge** of the industry
- Deliver **creative solutions** that challenge the status quo
- Provide required data and information for **quantitative analysis**
- Generate **ideas** and **recommendations**
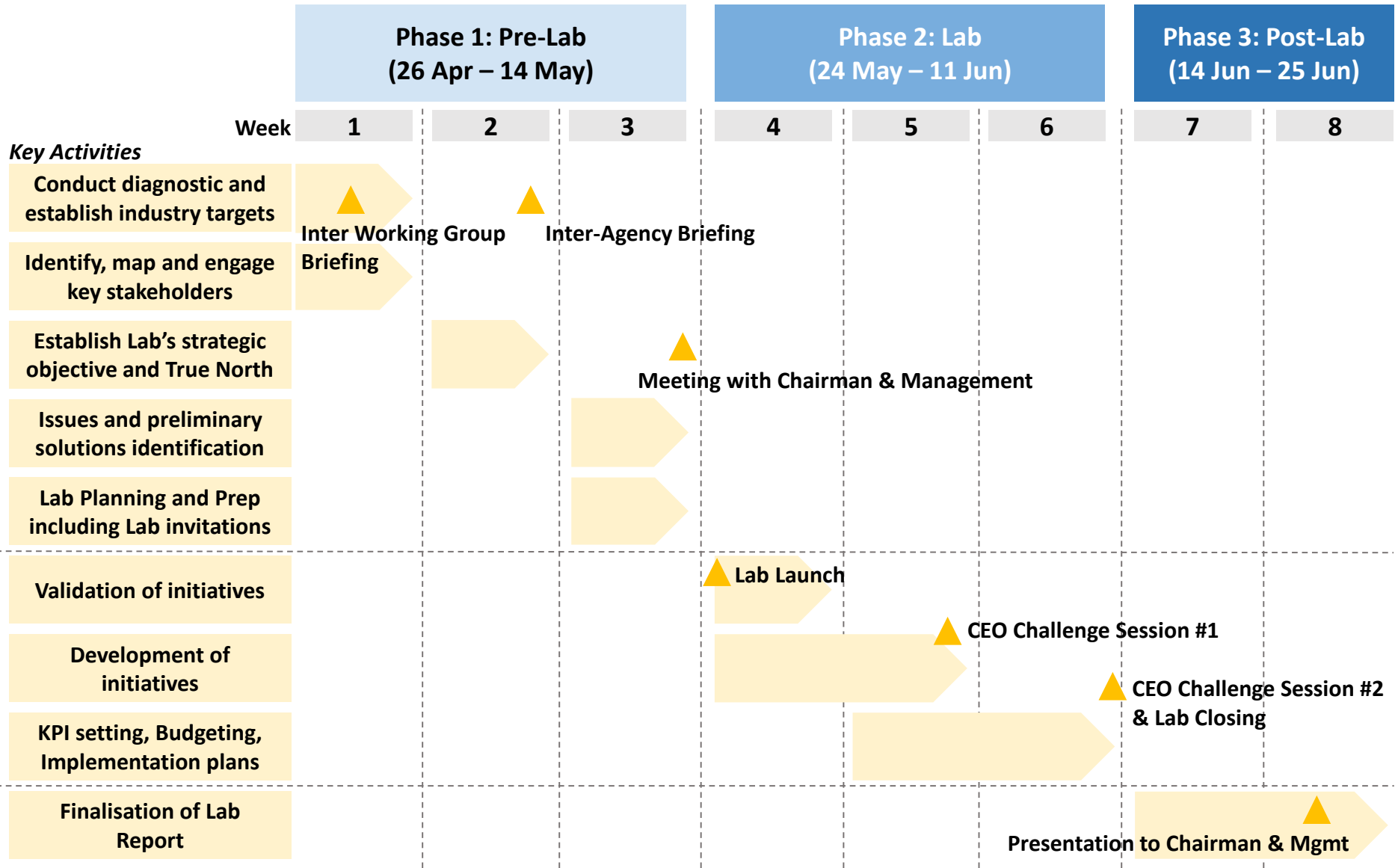- Develop and script **detailed implementation plans**

Leadership (Chairman, Chief Sectors)

- Provide **insights and knowledge** of the industry
- Make **key decisions** e.g., CEO Challenge sessions
- **Point of communication** to the staff of the company
- **Break through silos** and foster collaboration
- Provide leadership and focus on **shaping industry roadmap**

MCMC

The lab's project timeline of 8 weeks across 3 phrases

▲ Key Events

	Phase 1: Pre-Lab (26 Apr – 14 May)			Phase 2: Lab (24 May – 11 Jun)			Phase 3: Post-Lab (14 Jun – 25 Jun)	
Week	1	2	3	4	5	6	7	8

Key Activities

Conduct diagnostic and establish industry targets
▲ Inter Working Group Briefing   ▲ Inter-Agency Briefing

Identify, map and engage key stakeholders

Establish Lab's strategic objective and True North
▲ Meeting with Chairman & Management

Issues and preliminary solutions identification

Lab Planning and Prep including Lab invitations

Validation of initiatives
▲ Lab Launch

Development of initiatives
▲ CEO Challenge Session #1

▲ CEO Challenge Session #2 & Lab Closing

KPI setting, Budgeting, Implementation plans

Finalisation of Lab Report
▲ Presentation to Chairman & Mgmt

MCMC

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Over 30 stakeholders were interviewed during Pre-Lab

Interviews Conducted

Government

Economic Planning Unit (EPU) · Ministry of International Trade and Industry (MITI) · Kementerian Tenaga dan Sumber Asli (KeTSA)

Key Industry Players

There were more than 250 lab members across over 75 organisations that participated throughout the Lab phase

Industry

1. Allo technology Sdn Bhd
2. Arus Restu Sdn Bhd
3. AWS
4. Axiata Group Berhad
5. C2 consult
6. Celcom Axiata Berhad
7. Celcom Timur (Sabah) Sdn Bhd
8. China Mobile International (Malaysia) Sdn Bhd
9. Common Tower Technologies Sdn Bhd
10. CSF Group
11. Danawa Resources Sdn Bhd
12. DECIX-JBIX Malaysia
13. Digi Telecommunication Sdn Bhd
14. Enterprise Products Integration (EPI)
15. Exitra Solutions Sdn Bhd
16. Extreme Broadband Sdn Bhd
17. Facebook Malaysia
18. Green Packet Berhad
19. HeiTech Padu Berhad
20. Hexa Capital Consultancy
21. Hitachi Sunway Data Centre Services Sdn Bhd
22. Huawei Technologies Malaysia Sdn Bhd
23. iFiber
24. iSkill
25. Juniper Networks
26. Malaysia Debt Ventures (MDV)
27. Malaysian Photovoltaic Industry Association (MPIA)
28. Malaysian Solar Resources Sdn Bhd
29. Maxis Broadband Sdn Bhd
30. Microsoft
31. MSA Resources Sdn Bhd
32. MyIX
33. MyKRIS Asia Sdn. Bhd
34. MyNOG
35. MyTelehaus Data Centres Sdn Bhd
36. Network Engineering
37. Northern Corridor Implementation Authority (NCIA)
38. NTT Ltd Malaysia/ NTT MSC Sdn Bhd
39. PP Telecommunication Sdn Bhd
40. Reach Ten Multimedia Sdn Bhd
41. REDtone Engineering & Network Services Sdn Bhd/ REDtone Telecommunications Sdn Bhd
42. Sabah Net Sdn Bhd
43. Sacofa Sdn Bhd
44. Sarawak Energy Berhad
45. Sarawak Information Systems Sdn Bhd
46. Telekom Malaysia Berhad
47. Tenaga Nasional Berhad (TNB)
48. TIME dotCom Berhad
49. TNB Renewables Sdn Bhd
50. TPM Technopark Sdn Bhd
51. TT Dotcom Sdn Bhd
52. U Mobile Sdn Bhd
53. Uptime Institute
54. X86 Network Sdn Bhd
55. YTL Communications Sdn Bhd

Government

1. Attorney General's Chambers Malaysia (AGC)
2. Department of Environment, Ministry of Environment and Water
3. Department of Fisheries, Kementerian Pertanian dan Industri Makanan
4. Department Of Occupational Safety And Health Malaysia, Ministry of Human Resources
5. Energy Commission (EC)
6. EPU, Bahagian K-Ekonomi
7. EPU, Strategic Change Management Office (SCMO)
8. Hydrographic Centre
9. Jabatan Perlindungan Data Peribadi Malaysia (JPDP)
10. Jabatan Ukur dan Pemetaan Malaysia (JUPEM)
11. Kementerian Kewangan Malaysia (MOH)
12. Kementerian Komunikasi dan Multimedia Malaysia (KKMM)
13. Kementerian Pembangunan Usahawan dan Koperasi (MEDAC)
14. Kementerian Perdagangan Dalam Negeri dan Hal Ehwal Pengguna Malaysia (KPDNHEP)
15. Kementerian Tenaga dan Sumber Asli (KeTSA)
16. Malaysia Digital Economy Corporation (MDEC)
17. Malaysian Investment Development Authority (MIDA)
18. Malaysian Maritime Enforcement Agency
19. Unit Pemodenan Tadbiran dan Perancangan Pengurusan Malaysia (MAMPU)
20. Malaysian Communications And Multimedia Commission (MCMC)
21. Ministry of International Trade and Industry (MITI)
22. Ministry of Transport (MOT)
23. National Cyber Security Agency (NACSA)
24. Malaysian National Security Council (NSC)
25. Northern Corridor Implementation Authority (NCIA)
26. Sarawak Multimedia Authority (SMA)
27. Unit Perancang Ekonomi Negeri, Jabatan Ketua Menteri Melaka

The NIEL has formulated JENDELA+ which focused on interconnection infrastructure initiatives to support the implementation of MyDIGITAL

Interconnection Ecosystem Infrastructure → **SUPPORTS**

MyDIGITAL DAN RANGKA TINDAKAN (BLUEPRINT) EKONOMI DIGITAL MALAYSIA

Definition

International Connectivity (IC)
- International & domestic submarine cables are key infrastructures which provide cross-border data connectivity

Internet Exchange Point (IXP)
- Infrastructure which provide exchange of internet traffic amongst ISPs and CDNs, reducing the need for upstream data transit and indirectly per-bit delivery cost

Data Centre (DC)
- Dedicated physical space organisations use to house critical applications and data
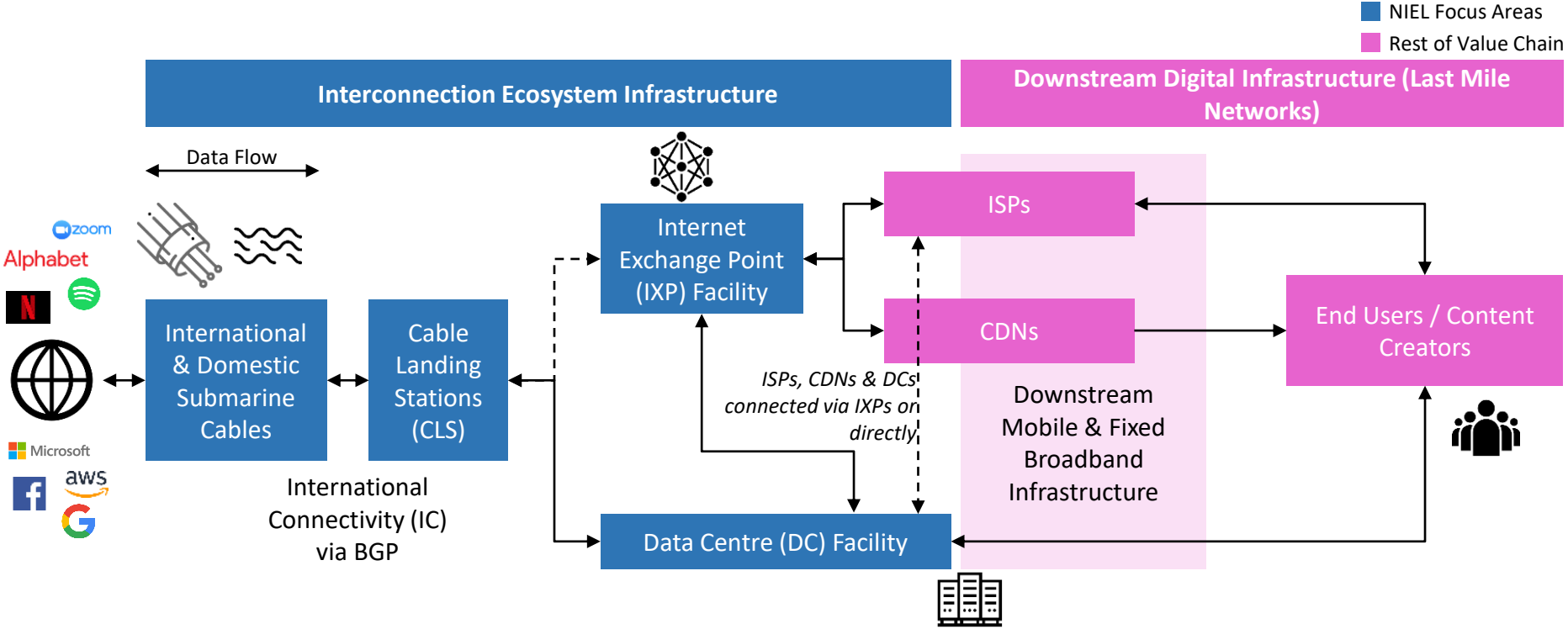
Thrust 3: Build enabling digital infrastructure

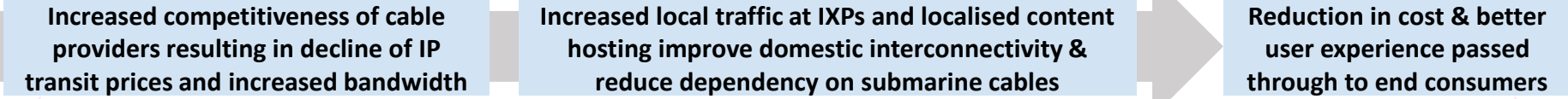**Strategy 3:** Enhancing digital technology infrastructure capabilities

Initiative 5: Boost capabilities of domestic data centre companies to provide high-end cloud computing services

Initiative 6: Attract more international submarine cables landing in Malaysia to expand global connectivity

DCs, IXPs and IC are deeply integrated and act as the interconnection ecosystem infrastructure which support service providers to cater to last mile network users within the value chain

■ NIEL Focus Areas
■ Rest of Value Chain

Interconnection Ecosystem Infrastructure

Downstream Digital Infrastructure (Last Mile Networks)

Data Flow

International & Domestic Submarine Cables

Cable Landing Stations (CLS)

International Connectivity (IC) via BGP

Internet Exchange Point (IXP) Facility

ISPs, CDNs & DCs connected via IXPs or directly

Data Centre (DC) Facility

ISPs

CDNs

Downstream Mobile & Fixed Broadband Infrastructure

End Users / Content Creators

Impact of interconnection ecosystem infrastructure efficiencies towards last mile networks

Increased competitiveness of cable providers resulting in decline of IP transit prices and increased bandwidth

Increased local traffic at IXPs and localised content hosting improve domestic interconnectivity & reduce dependency on submarine cables

Reduction in cost & better user experience passed through to end consumers

The roles of international connectivity, IXPs, DCs are deeply integrated in the interconnection ecosystem infrastructure and are critical to the performance and sustainability of last mile networks

Note: ISPs refer to Internet Service Providers; CDN refers to Content Delivery Network; BGP refers to Border Gateway Protocol

With Malaysia's digital transformation journey underway, its interconnection ecosystem infrastructure as the nation's backbone must be ready for Malaysia to emerge as an attractive business destination for DCs, IXPs and IC

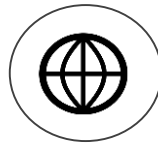**4 Case for Change towards Malaysia digital transformation were identified**

Low Number of Hyperscale DC Investment
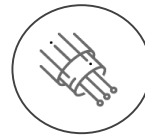
High IP Transit Price

Low Number of Peering Entities (relative to SEA peers)

Unequal Internet Experience between Peninsular Malaysia (PM) and East Malaysia (EM)

Aspiration:
Malaysia as the preferred business destination

Lab's Outcome: 9 initiatives were identified with potential private investment of ~RM 1 billion

TRUE NORTH

Hyperscale Data Centre : Target investment of RM 80 million*
Internet Exchange Point : Target investment of RM 2 million
International Connectivity : Target investment of RM 900 million

Focus Area 1

A   **Hyperscale Data Centre (DC)**

1. Renewable Energy for DCs through Third Party Access
2. Tracking DC Industry Data & Tariffs Request
3. Data disclosure SOPP framework
4. Addressing specific talent gaps in DC industry
5. Industry-driven DCs Projects

B   **Internet Exchange Point (IXP)**

6. Increasing Domestic Peering Base (PM & EM)

Focus Area 2

C   **International Connectivity (IC)**

7. Strategic interconnect routes and nodes for East to West connectivity
8. Integrated Process for International Connectivity Approvals
9. Incentives Scheme for International Connectivity

*Does not include Hyperscale Data Centres announced in MyDigital

Through the lab, 9 Industry-led projects identified throughout Peninsular Malaysia, Sabah & Sarawak by 2025
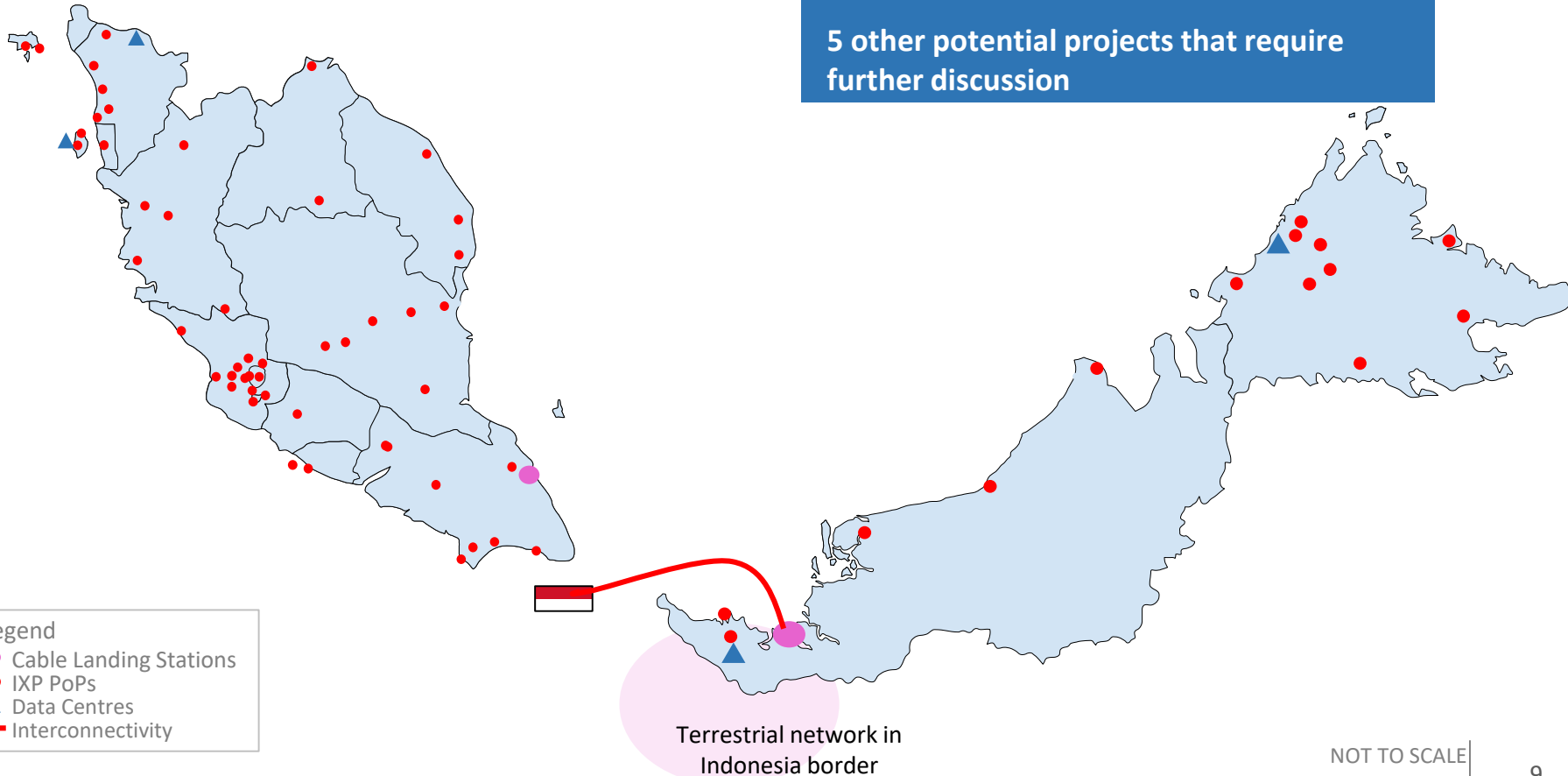
Current situation:
- 51 DC sites
- 12 IXP major and satellite nodes
- 15 Cable Landing Stations
- 19 international cables

JENDELA+
- 4 DC sites
- 66 IXP PoPs
- 1 new IC in EM
- 1 new route within PM
- 2 new identified potential routes

5 other potential projects that require further discussion

Legend
- ● Cable Landing Stations
- ● IXP PoPs
- ▲ Data Centres
- ▬ Interconnectivity

Terrestrial network in Indonesia border

NOT TO SCALE

Initiatives for JENDELA+ Implementation (Focus Area 1)

No.	Description	Deliverables	Target
1	Renewable Energy for DCs through Third Party Access	• Availability of necessary policies and framework on RE for DCs through full TPA/sleeved PPA	As and when there's demand
2	Tracking DC Industry Data & Tariffs Request	• Reclassification of electricity tariffs for DC based on industrial rate	Q4 2022
3	Data disclosure SOPP framework	• Implementation of Data Disclosure SOPP Framework for Cloud through DCs licensing	Q1 2022
4	Addressing specific talent gaps in DC industry	• Framework for Cloud/DCs Talent Development under MDEC's Industry Skills Platform	Q1 2022

5	Industry-driven DCs Projects	• New DC sites to operationalise in Malaysia:
		  • 2 in PM
		  • 2 in Sabah and Sarawak
			4 DC sites by 2024

6	Increasing Domestic Peering Base (PM & EM)	• Recruit additional new peering / interconnection members	250 total peering by 2025

SOPP – Standard Operating Procedures and Policy
TPA – Third Party Access
PPA – Power Purchase Agreement

Initiatives for JENDELA+ Implementation (Focus Area 2)

No.	Description	Deliverables	Target
7	Strategic interconnect routes and nodes for East to West connectivity	• New IXPs • New International Connectivity	64 IXPs in 2022 2 IXPs in 2023 1 new IC in EM by Dec 2021 1 new route within PM by 2022
8	Integrated Process for International Connectivity Approvals	• Geospatial data exchange between MCMC and Pusat Hidrografi Nasional • Integration of the system / process for International Connectivity Approvals	Q4 2021 2022
9	Incentives Scheme for International Connectivity	• Tax incentive scheme coordination through ITA • Financing facilitation for digital infrastructure through MDV	Q3 2021 As and when required

ITA - Investment Tax Allowance
MDV – Malaysia Debt Ventures

In addition to initiatives developed in the Lab, the Industry has further highlighted the following areas

① **Regulations of DCs**
- To allow industry (including other government agencies) to have further engagements with MCMC on the associated mechanism, prior to the regulation coming to effect.

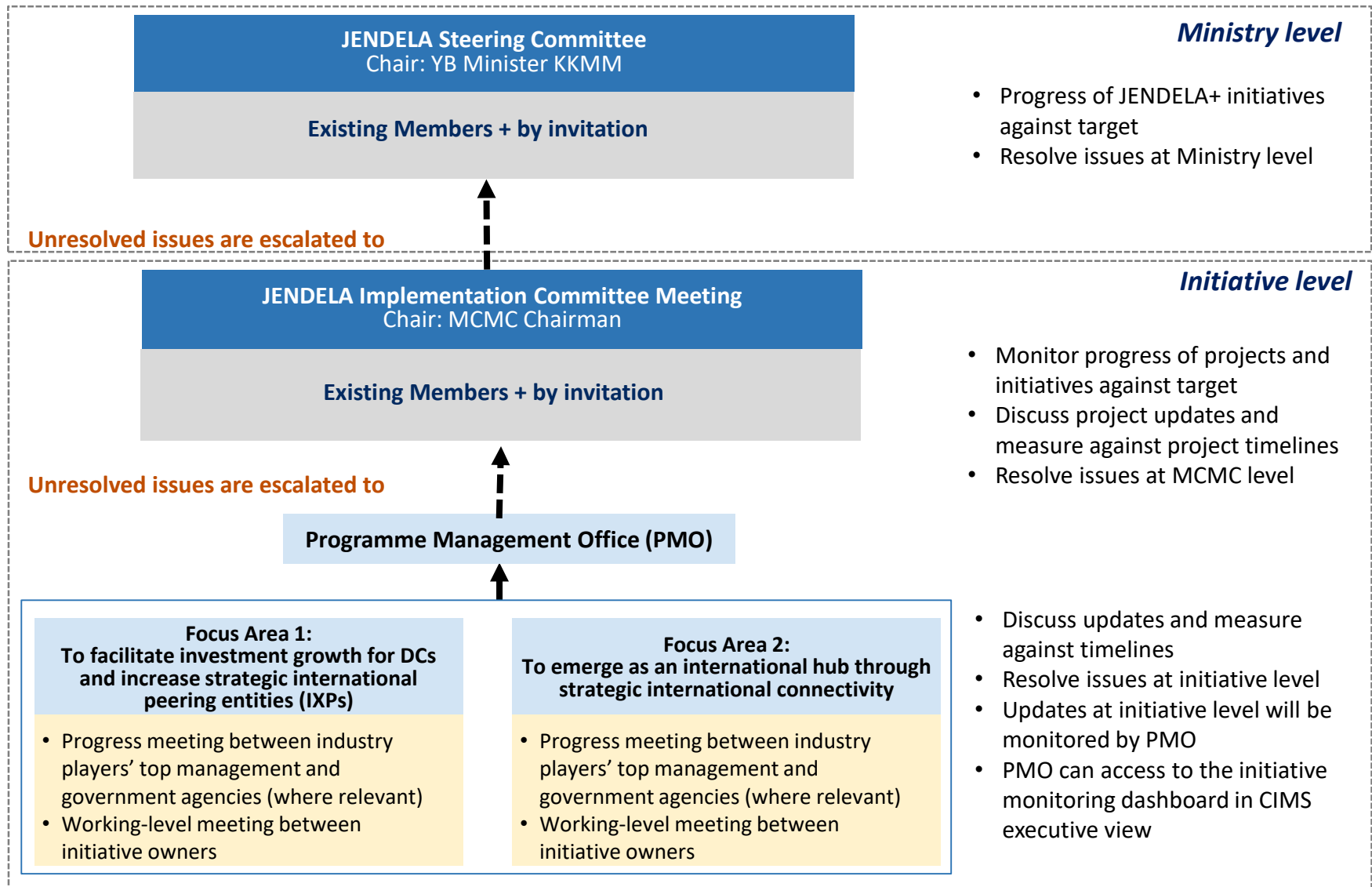> MCMC will engage with the relevant parties

② **New Indonesian Maritime Policies**
- In March 2021 a decree was published whereby the Coordinating Minister of Maritime Affairs and Investment made 10 key decisions to improve pipeline and submarine cables deployment in the country. Bilateral engagement will be required.

> MCMC to initiate discussion with relevant Ministries and other government agencies

The JENDELA Governance Structure will oversee implementation and reporting of JENDELA+ initiatives

JENDELA Steering Committee
Chair: YB Minister KKMM

Existing Members + by invitation

- Progress of JENDELA+ initiatives against target
- Resolve issues at Ministry level

Unresolved issues are escalated to

Initiative level

JENDELA Implementation Committee Meeting
Chair: MCMC Chairman

Existing Members + by invitation

- Monitor progress of projects and initiatives against target
- Discuss project updates and measure against project timelines
- Resolve issues at MCMC level

Unresolved issues are escalated to

Programme Management Office (PMO)

Focus Area 1:
To facilitate investment growth for DCs and increase strategic international peering entities (IXPs)

- Progress meeting between industry players' top management and government agencies (where relevant)
- Working-level meeting between initiative owners

Focus Area 2:
To emerge as an international hub through strategic international connectivity

- Progress meeting between industry players' top management and government agencies (where relevant)
- Working-level meeting between initiative owners

- Discuss updates and measure against timelines
- Resolve issues at initiative level
- Updates at initiative level will be monitored by PMO
- PMO can access to the initiative monitoring dashboard in CIMS executive view

Note: *To syndicate once office has been established and roles/responsibilities have been officially communicated

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Thank You