NUSANTARA

Nusantara
Indonesia's Smart and Sustainable Forest City

Prof. Mohammed Ali Berawi M.Eng.Sc, Ph.D

**Deputy of Green and Digital Transformation
Nusantara National Capital Authority**

**Symposium on 'Digital Economy and Sustainability
and Launch of the Digital Innovation and Sustainable
Economy Centre (DISC)**

Jakarta, 24th August 2023

Nusantara's Scope of Development

Total Area
Land & Water IKN
324,332 Ha

Land Area
256,142 ha

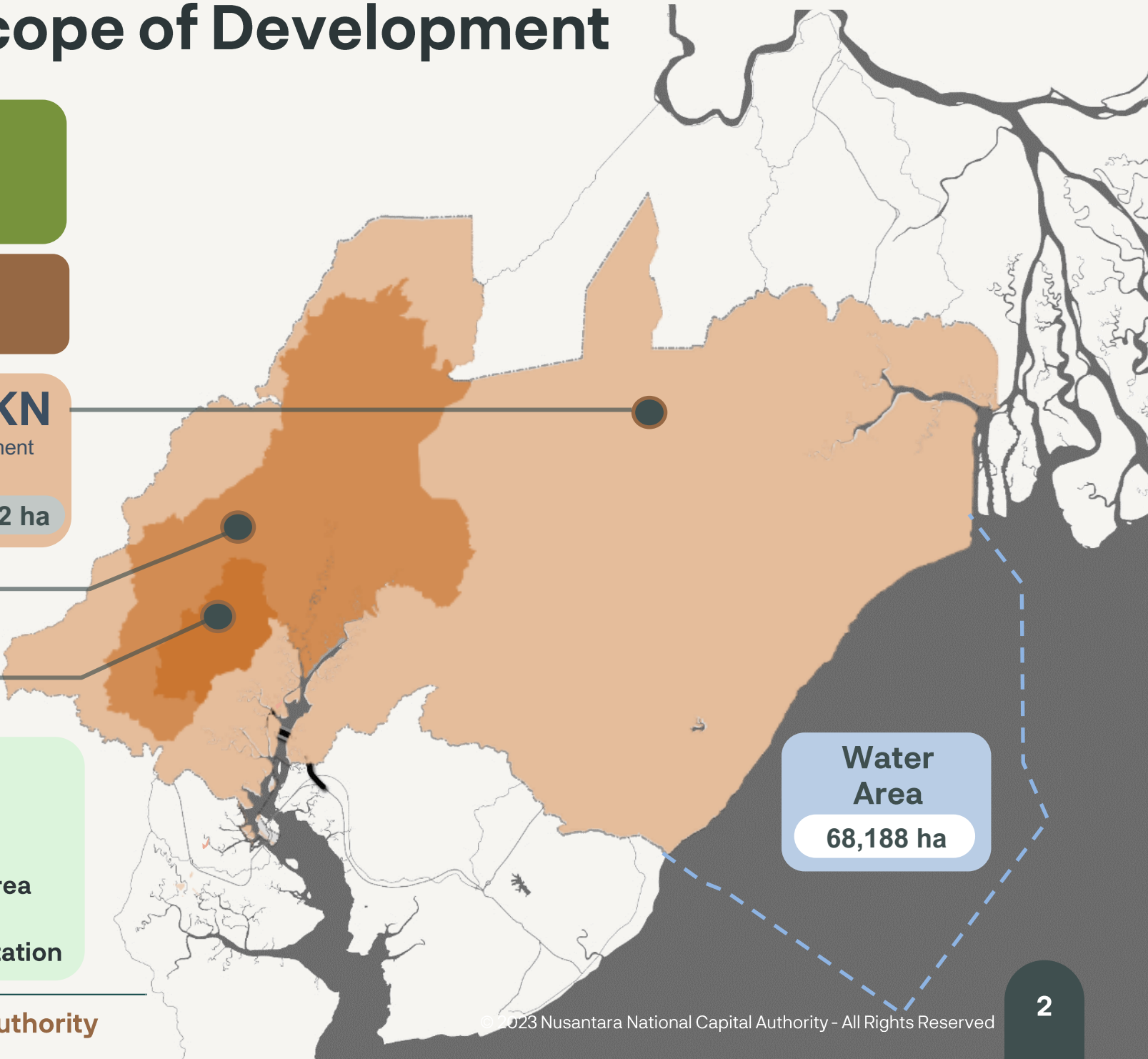**KIKN**
Urban Area
56,180 ha

+

KP-IKN
Development Area
199,962 ha

KIPP
Government Core Area
6,671 ha

10%
Parks and Food Production Area

25%
Urban Built Area

65%
Tropical Forest through Reforestation

Water Area
68,188 ha

2

Nusantara's Nine Economic Generators

Government Core Area
KIPP – 6,671 hectares

Economic and Financial Center
West IKN – 17,206 hectares

Renewable Energy Area
South IKN – 6,753 hectares

Tourism and Leisure
East IKN 1 – 9,761 hectares

Education Services
North IKN – 12,067 hectares

Innovation and Research
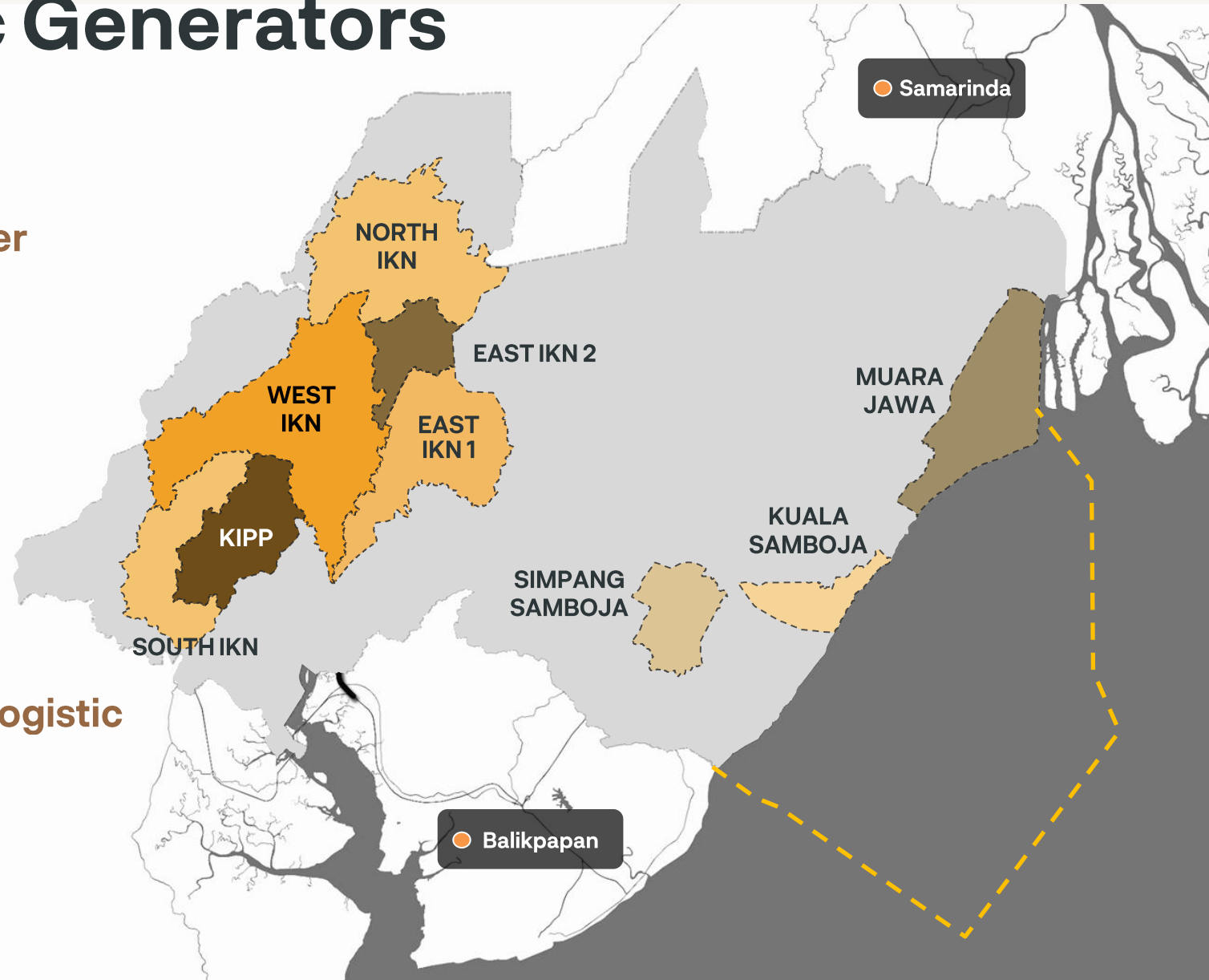East IKN 2 – 3,720 hectares

Agro-commodities, Trade & Logistic
Simpang Samboja – 2,986 hectares

Agriculture Industry
Kuala Samboja – 4,299 hectares

Fisheries and Agricultural
Muara Jawa – 9,084 hectares

Samarinda

NORTH IKN

EAST IKN 2

WEST IKN

EAST IKN 1

MUARA JAWA

KIPP

KUALA SAMBOJA

SOUTH IKN

SIMPANG SAMBOJA

Balikpapan

Nusantara Development's Principle

A Modern City of the Future

Green

Resilience

Sustainable

Inclusive

Smart

Nusantara Smart City Infrastructure Layers

Smart City

Application

- Smart Governance
- Smart Transportation and Mobility
- **Smart Living**
- Smart Natural Resources and Energy
- Smart Industry and Human Resources
- Smart Built Environment and Infrastructure

Active Infrastructure

Command Center and Data Center

Fiber Optic Cable Networks

Fixed Broadband Infrastructure

BTS 5G NSA

Mobile Broadband Infrastructure

Passive Infrastructure

Physical Infrastructure (*e.g., Multi Utility Tunnel*)

Nusantara: Smart City

Dynamic and inclusive city, ready to face future changes, and leverage technology to improve productivity and quality of life

1 Governance

- Digital Identification
- Data Exchange Layer
- Application's Layer

Smart Administration	Smart Permit
Digital Identities	

2 Transportation & Mobility

- Intelligent Transport System
- MaaS
- EV Ecosystems
- Smart Logistics

Urban Air Mobility	EV Charging
Autonomous Driving System	IoT in Logistics

3 Living

- Air Monitoring
- Health & Welfare
- Public Safety & Space Management

Telemedicine	Early Warning System
Threat Detection	Smart Public Spaces

4 Natural Resources & Energy

- Energy Management & Digitalization
- Resource Management
- Smart Forest & Green Management

Smart Grid	Smart Waste Management
Biodiversity Monitoring	

5 Industry & Human Resources

- Smart Education
- Smart Job Training and Matching
- Smart Tourism
- Metaverse Digital Social Platform
- Digital Payment System
- Technology Demonstration Center
- Urban Citizen Living Lab
- Digital Platform for SMEs

Digital Libraries	Digital Museum	Smart Industries

6 Built Environment & Infrastructure

- Facility Management System
- Building Management System
- Propagation of Internet Acces
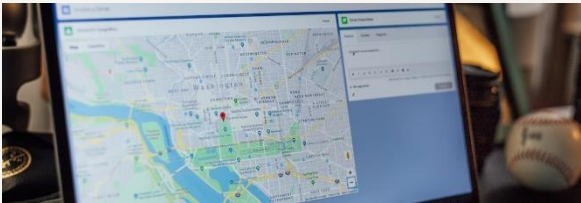- Smart Infrastructure System

Digital Twin	Smart Building	Smart Pole
Building / Infrastructure Automation System		

1 Smart Governance

Digital Identification	Data Exchange Layer	Application's Layer
Civil Registers	GIS-based Control	Smart Permit
Secure ID Documents and Readers	City Integrated Operation Center	Smart Administration
Digital Identities	Centralized Citizen Reporting System	E-Procurement

Otorita Ibu Kota Nusantara

2 Smart Transportation & Mobility

2.1 Intelligent Transport System

2.2 Mobility-as-a-Service

Advanced Traffic and Parking Management System

Advanced Public Transportation System

Urban Air Mobility

Hyundai

Autonomous Driving System

Incident Management System

Commercial Vehicle Operation System

Battery Swapping Station

Transactions

Servies fees

Battery Swapping Service

2.3 *Electric Vehicle Ecosystem*

Electronic Payment System

Advanced Traveller Information System

2 Smart Transportation & Mobility

2.4 Smart Logistics

Smart Delivery

Autonomous Mobile Robots (AMRs)

Smart Labels

Logistic Tracking System

Smart Warehouse

IoT System in Logistics

AI-enhanced Supply Chain Analytics

3 Smart Living

Pollution Sensors

Pollution Monitoring
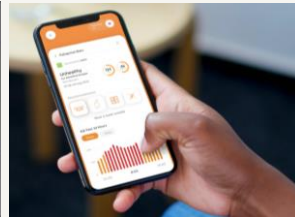
Live Report

Hologram Meeting

Emergency Response
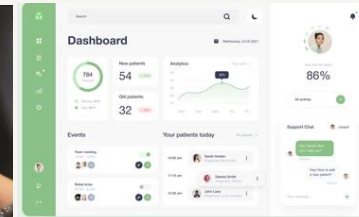
Integrated Health Dashboard

Health and Welfare System

- Telemedicine
- Emergency Response
- Smart Healthcare
- Smart Working

Pollution Control System

- Air Pollution Monitoring
- Air Pollution Controlling

Public Space and Safety System

- Crisis Management
- Urban Safety and Mobility
- Disaster Prediction
- Public Wifi
- Environmental Sensors
- Interactive Displays

Disaster Response and Management

- Integrated Command center
- Weather Info and Alert Based on Rainfall Data
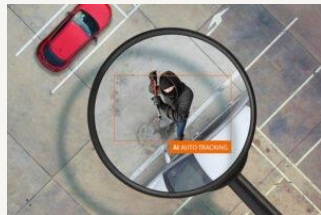
Suspect Detection

Crowd Management

Fiber Optic and *Wifi*

Integrated Command and Control Center

Live Density Report

Environmental Display

4 Smart Natural Resource and Energy

4.1 Resource Management

4.1.1 Smart Water Management

- Smart Metering
- Water SCADA
- Smart Water Quality Monitoring

4.1.3 Smart Wastewater Management

- Smart Rain & Storm Water Management
- River Pollution Monitoring
- Greywater Recycling
- Water SCADA

4.1.2 Smart Waste Management

- Smart Bin
- Smart Waste Fleet
- Reduce, Reuse, Recycle Material Recovery Facility (3R MRF)

4.2 Energy Management & Digitalization

- 4.2.1 Smart Grid
- 4.2.2 Smart Energy Market
- 4.2.3 Vehicle to X Ecosystem
- 4.2.4 Storage System

Otorita Ibu Kota Nusantara

4 Smart Natural Resource and Energy

4.3 Smart Forest and Green Management

Carbon Stock and Emissions Monitoring
4.3.1

- Carbon Monitoring
- Carbon Emissions Calculator
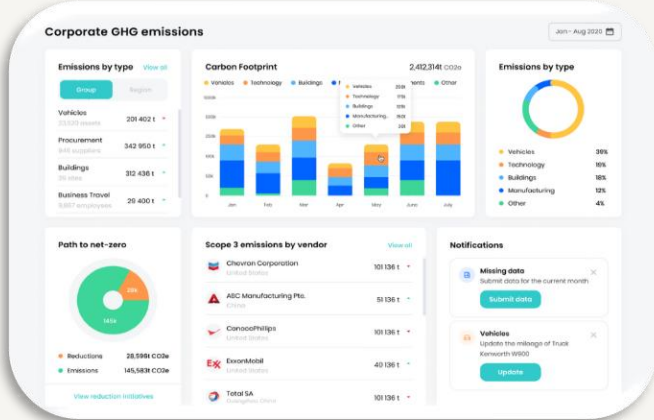
Smart Forest Biodiversity Monitoring
4.3.2

- IoT sensor
- Trap Camera
- Dashboard Database
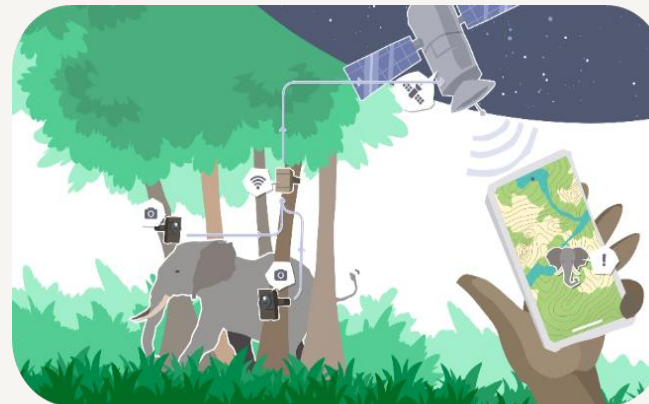
Precision Farming
4.3.3

- Data analytics capabilities
- Location optimization for crops farmers
- Automated fertilizer & water
- Remote monitoring & control
- Smart feeding management
- Disease detection & prevention

Sahal *et al*, 2021

Smart Forest Fire Management
4.3.4

- Forest fire hotspot monitoring
- Forest fire emergency alert system
- Forest fire tracking capability
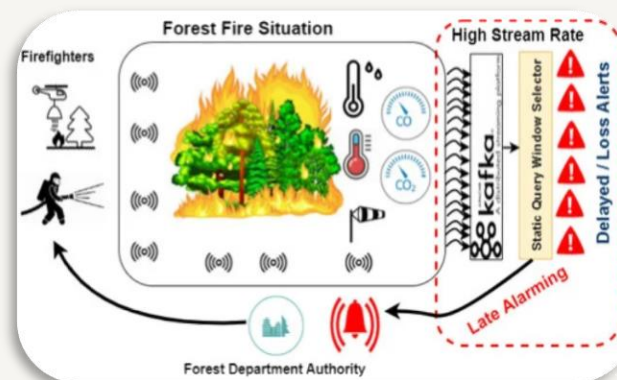
5 Smart Industries and Human Resources

Industries

Alex Hudson on Unsplash, 2019

Local SME's Support Platform

Urban Design Development, Ministry of PUPR, 2022

Urban Citizen Living Lab

Lenny Kuhne on Unsplash, 2019

Technological Demonstration Center

Louis Reed on Unsplash, 2018

Chemical & Pharmacy Center

Crystal Kwok on Unsplash, 2017
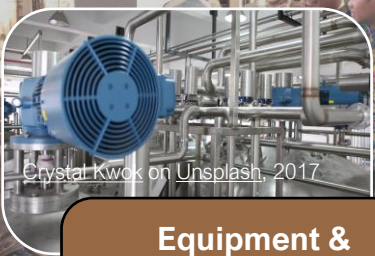
Equipment & Machinery Center

(gamatechno.com)

Smart Tourism

Human Resources

Entertainment and Creativity Program

Digital Social Platform

Academic Information System

National Student Admission Platform

Professional & Skill Development Platform

Digital Library
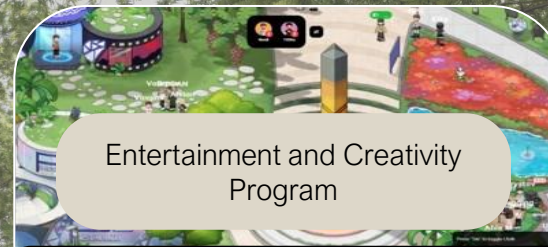
E-Learning Platform
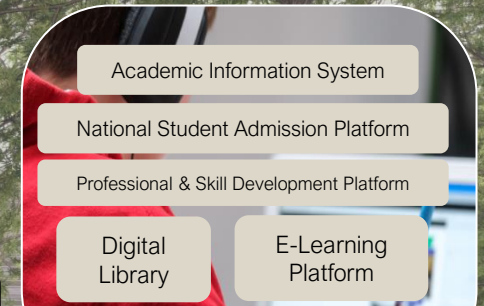
Smart Education

Citizen Service Collaboration

6 Smart
Built Environment & Infrastructure

5G Infrastructure

Denny Müller on Unsplash , 2020

Smart Infrastructure

Denys Nevozhai on Unsplash , 2016

Smart Building

JC Gellidon on Unsplash, 2018

Social Facilities

Urban Design Development, Ministry of PUPR, 2022

Commercial Facilities

Urban Design Development, Ministry of PUPR, 2022

Smart Utilities

Doris Morgan on Unsplash , 2021

Evgeniy Surzhan on Unsplash, 2021-

Smart Construction

Gis.co.id

GIS-Based Monitoring

fvmt.com , 2021

Building Automation and Management System

TechRepublic , 2022

IoT-sensing in Monitoring
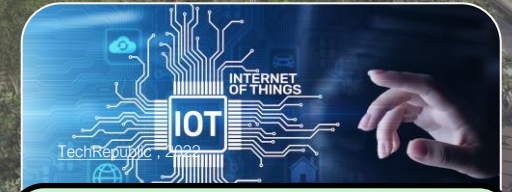
TechRepublic , 2022

Digital Twin

Nusantara's Smart Building Guideline

The preparation of the Smart Building Guidelines document aims to provide reference standards for the development of smart buildings in IKN. This document discusses sustainable development in the context of the Nusantara, the principles of Smart Building, sustainable management of resources (energy, water and air), as well as implementation guidelines in the Capital City of the Nusantara.

NUSANTARA'S SMART BUILDING GUIDELINE

Green and Digital Transformation
Nusantara Capital Authority

ikn.go.id/BangunanCerdas

CONTENTS

Building Automation & Management System

Control Room & Data Center | **Communication System**

FTTR | **Energy System** | **Security System**

Digital Twin | **Resource System** | **Safety System**

Lighting System | **Mobility System** | **HVAC System**

Basic Requirements | Scope Requirements

Smart Building Technology Feature Completion Matrix

009/SE/Kepala-Otorita IKN/VIII/2023

Nusantara's Smart City Master Plan Document

Blueprint for Digital Transformation Strategy for Nusantara

BLUEPRINT FOR
DIGITAL TRANSFORMATION STRATEGY IKN

Nusantara National Capital Authority

The Smart City Blueprint document begins with an identification of the background and vision of the Capital City of the Nusantara, a World City for All.
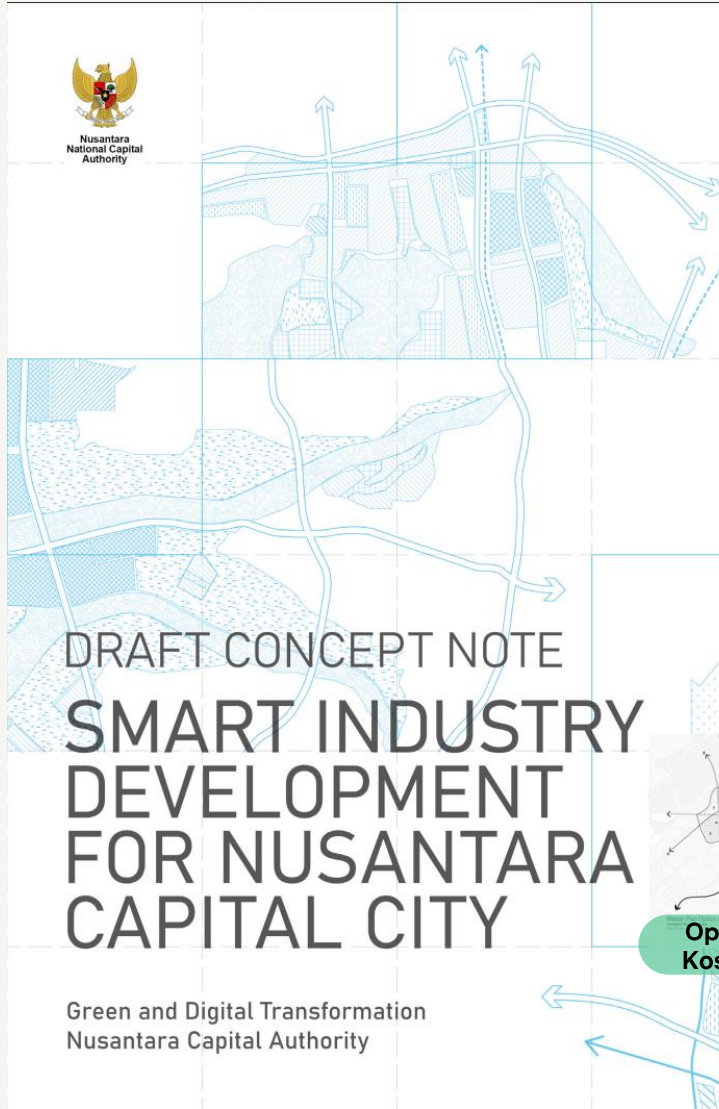
Furthermore, the formulation of the features and scope of smart city development is carried out by identifying user personas to map the potential of residents who will live, work, and visit the IKN based on demographic analysis and IKN development plans based on Presidential Regulation No. 63 of 2022.

Next, identification of application domains is mapped into **6 smart city domains**, along with identification of a number of **67 smart features** that exist in each domain and subdomain of Nusantara smart city

1 Governance
2 Transportation & Mobility
3 Living
4 Natural Resources & Energy
5 Industry & Human Resources
6 Built Environment & Infrastructure

Smart Industries Concept Note
Nusantara Capital City

Table of Content

The development of the Smart Industries concept note study book at IKN is intended to explore and serve as a recommendation study on the potential for future industrial development in the Nusantara.

The study was developed from the identification of industrial clusters in the Nusantara master plan document, Perpres No. 63 of 2022, with benchmarks for international-class industrial areas in various countries in the world. **Five main industrial cluster** recommendations were produced with **three regional development** models which have a location base in the West IKN

Solar Modules   **Electric Vehicle**   **Pharmaceutical**

Drones   **Semiconductors**
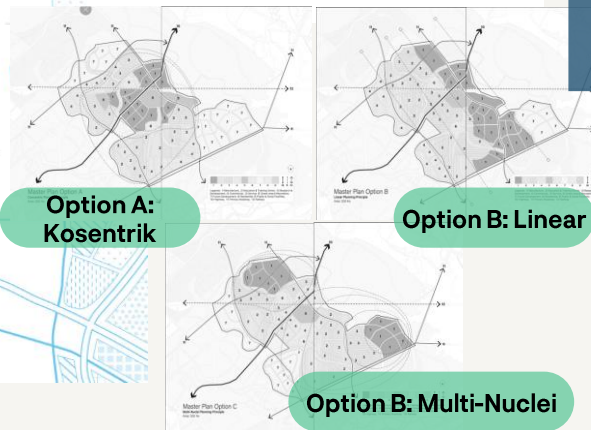
Option A: Kosentrik   **Option B: Linear**   **Option B: Multi-Nuclei**
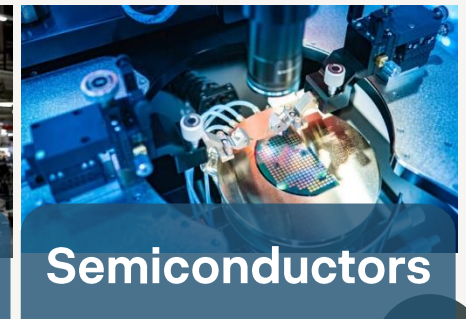
Monitoring Nusantara Apps
(montara.ikn.go.id)

In supporting the monitoring and evaluation of IKN development effectively and in real-time, **Montara is a web-based digital solution for stakeholders** that allows monitoring, managing information, and **coordination in the development of IKN**. Apart from that, Montara has also increased the transparency of IKN deve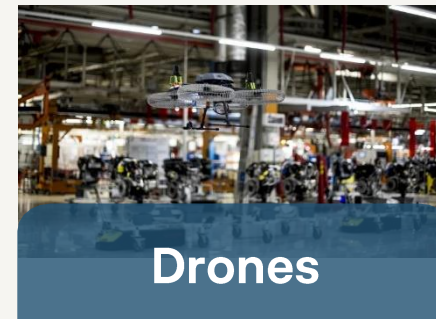lopment to the public. Montara as an application was developed strategically to meet the needs of OIKN and the public from information gathering, and evaluation process, to further analysis with AI and drone technology.
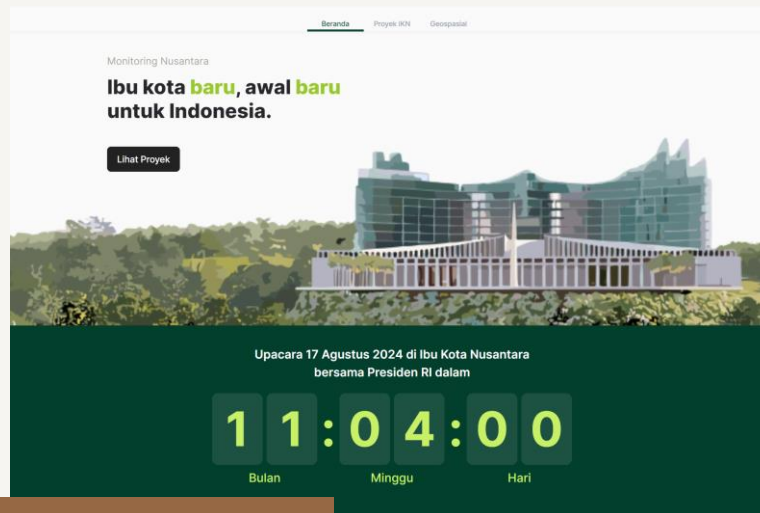
Project Map

Main Features

- **Public**: IKN Project and Map
- **Internal**: Project Detail, Issue, KPI's Monitoring and Tracking
- **Investor**: Land Use and Spatial Plan
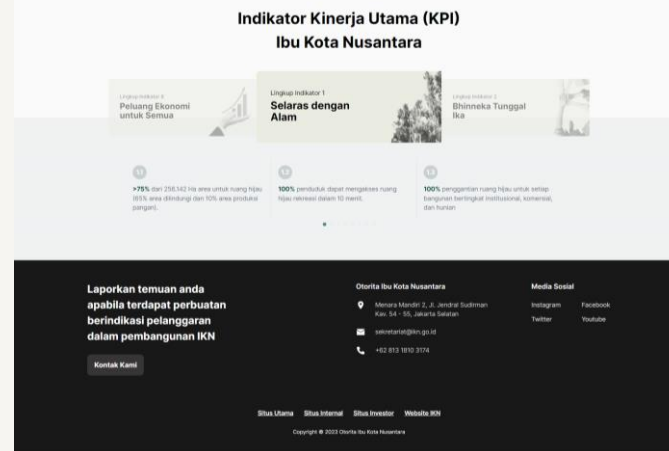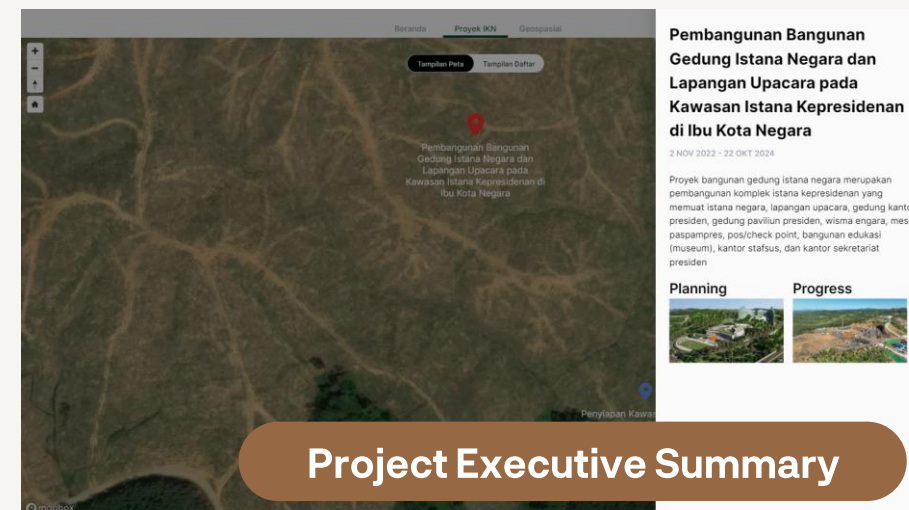
Project Executive Summary

Community Development Programs –
Coding Mum & Coding Difabel, and Solar Mum Program

Developing the Capital of the Nusantara as a **Smart City** with the active role of **local communities** in the digital ecosystem

Coding Mum & Coding Difabel, and Solar Mum Programme Launching,
Desa Bukit Raya, 5 Mei 2023

The introduction of community empowerment programs, especially for teenage to adult women, namely Coding Mum & Disabilities


Sumber Ilustrasi: Otorita IKN

PUSAT KOMUNITAS DIGITAL SEPAKU

#Menuju Kota Dunia untuk Semua.
Transformasi Hijau dan Digital OIKN

thdoikn@gmail.com thdoikn

Coding Mum Socialization

Solar Mum Socialization

Solar Mum Programme Launching
Desa Bukit Raya, July 12th 2023

Sumber Ilustrasi: Otorita IKN

Coding Mum & Coding Difabel Program Launching,
Desa Bukit Raya, July 12th 2023

Sumber Ilustrasi: Otorita IKN

Nusantara National Capital Authority

Nusantara Techno House

As an embodiment of the Nusantara Smart City master plan, the Rumah Teknologi facility is an educational destination for the exhibition of the Nusantara Capital city concept exhibition and a showcase for various technologies that can be implemented into the Nusantara Smart City Blueprint.

Technology Exhibition Room and Proof of Concept

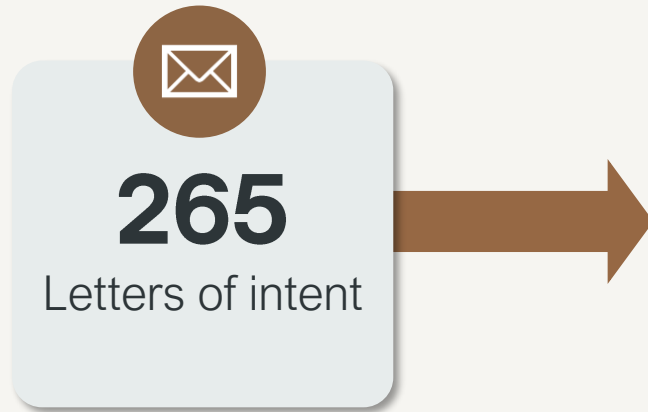|	
Urban Air Mobility	Smart Living Appliances
Smart Energy	Smart Building
Education Tech	Exhibition Room
Monitoring Room	

Nusantara National Capital Authority

Investors' Interest: A Snapshot

As of August 17th, 2023

265
Letters of intent

received, consisting of the following sectors:

41
NDA

15
1 on 1 Meeting

7
MOU

About 50% of countries represented by companies are foreign companies

8	Connectivity	13	Mixed Use
16	Consultancy	4	Office spaces
16	Education	35	Other Goods and Services
29	Energy	55	Other Infrastructures
9	Health	25	Technology
16	Housing	15	Utility Providers
4	Industrial Zone	10	Waste Management

IKN Infrastructure Development Progress - 1
As of August 10th, 2023

Coordinating Ministry Office 1 [1]

Planned 11,04% | Realization 12,28%

Construction of Presidential Palace and Ceremonial Field in Presidential Palace Area

Planned 20,55% | Realization 21,72%
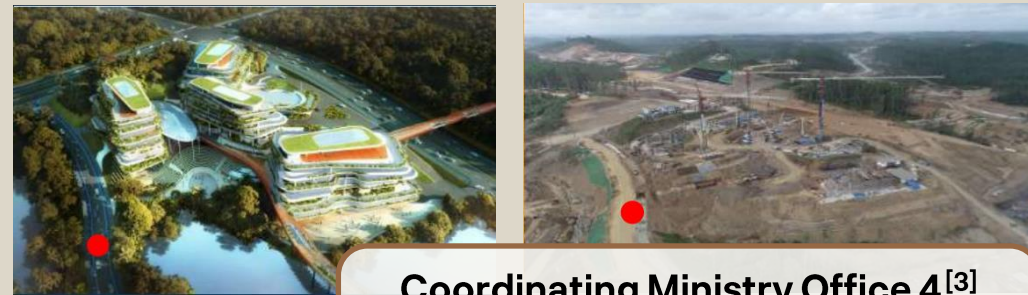

Coordinating Ministry Office 3 [2]

Planned 9,13% | Realization 9,63%

Construction of the Presidential Secretariat Building and Supporting Palace Areas

Planned 22,18% | Realization 22,31%

Coordinating Ministry Office 4 [3]

Planned 13,771% | Realization 13,774%

Source: Ministry of Public Works and Housing, 2023

[1] Coordinating Ministry for Maritime Affairs and Investment
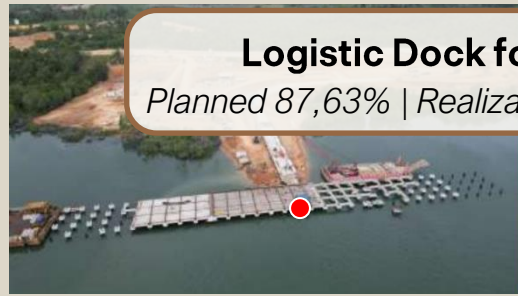[2] Coordinating Ministry for Politics, Law and Security
[3] Coordinating Ministry for Human Development and Culture

Logistic Dock for IKN
Planned 87,63% | Realization 87,79%

IKN Toll Road (Segmen 3B[1])
Planned 30,09% | Realization 30,50%

STA 13+290

[4] KKT Kariangau—Sp. Tempadung

Sepaku Semoi Dam
Planned 94,61% | Realization 93,01%

STA 2+175

West Side Sumbu Kebangsaan Road
Planned 33,74% | Realization 41,42%

Arrangement of the Sumbu Kebangsaan Phase I
Planned 51,93% | Realization 53,4%

Completed Works as of August 10, 2023:
- Preparation of KIPP Phase I IKN
- Construction of the Intake Infrastructure and the Sepaku River Pipeline Network
- Development of Mentawir Nursery Raw Water Supply
- Integrated Construction of Residential Buildings for Construction Workers

NUSANTARA

Nusantara Capital City Authority – Jakarta Office
Menara Mandiri Tower II, Floor 27
Jl. Jend. Sudirman Kav 54-55, RT.5/RW.3, Senayan,
Kebayoran Baru, Jakarta Selatan 12190, Indonesia

Nusantara Capital City Authority – Balikpapan Office
Pantai Mentari Compound
Jl. Mulawarman 6, Manggar, Kec. Balikpapan Timur
Kota Balikpapan 76116, Kalimantan Timur

Whatsapp	+62 813-1810-3174
	+62-821-1010-7498
Email	thd@ikn.go.id
	investasi@ikn.go.id
	sekretariat@ikn.go.id
Website	ikn.go.id
Instagram	@thdoikn

Sumber Ilustrasi: Kementerian PUPR