Electronics Industry Roadmap OVERALL STRATEGIES

Facilities and Services

- Establishment of Electronics Product Inclusive Innovation Center (EPIIC)
- Establishment of Center for Integrated Circuits and Devices Research
- Establishment of Wafer Fabrication Laboratory

Human Resources

- Strengthen the capabilities of universities in microelectronics IC design
- Development of collaborative inter-agency testing

R&D Technologies

Integrated Circuit Design:

- · Development of MCU with PMU and EHU
- Application of machine learning in IC layouting
- Development of electronics which are printed, reconfigurable, self-healing, batteryless, flexible, paper-based, biological, bio-compatible, liquid, transient, edible, and epidermal
- **Development of linchpin technologies**
- Development of logic core device, DRAM, Flash, and NVM technologies for More Moore applications
- Development of emerging memory devices including FeRAM, MRAM, CBRAM, OxRAM, polymer memory, and DNA-based massive storage devices
- Development of novel logic devices including SpinFET, Neg-C FET, Mott FET, NEMS, and topological insulator
- Development of Beyond-CMOS devices for More-than-Moore (MtM) applications including PUFs and RNGs
- · Development of novel architectures including GAA devices, 3D stacking, and co-integration of CMOS and Beyond-CMOS

Consumer/Medical / Industrial / Automotive Electronics:

- · Prototyping of robots and collaborative robots
- · Implementation of robot-as-a-service
- Prototyping of ventilators, oxygen concentrators, and digital and handheld medical devices
- Development of smart phones, smart batteries, and chargers
- Development of advanced driver assistance systems
- · Prototyping of electronic components for autonomous vehicles

Sensors:

- · Prototyping of integrated and intelligent actuators and sensors (e.g. biosensing, biophotonic, chemical, optoelectronics, mechanical, thermal, micromechanics, magnetics, chemometrics, and microarray)
- · Development of advanced sensors (e.g. biomimetic, eventbased, hyperspectral, living, and quantum sensors)

S&T Policies

Develop policies and standards for local electronics industry

Legend	
(Text For	ł):

VISION

200 M

Done

100 M Development Development of paperbased, biological, and bio-compatible electronics; Development of novel device



2028... 2027 Prototypes for

emerging memory devices and novel logic devices: Robot-as-aservice

of liquid, transient. edible.and epidermal electronics: Development of advanced sensors

By 2030, the Philippines will carve a niche in the global electronics market, building a "Made in the Philippines" brand that will capture market opportunities among end-product manufacturers and end-users.

Beyond-CMOS devices with PUFs and RNGs: Electronic components for autonomous vehicles:Novel device architectures

MILESTONES

OVERALL OUTCOME

Locally developed software and hardware prototypes, established facilities, and trained personnel for the advancement of Philippine electronics industry

210 M Development of MCU with PMU and EHU; Application of machine learning in IC layouting; Prototyping of robots.ventilators.and

of oxygen concentrators

20 M

Development of printed

electronics; Prototyping

smartwearables:

MCU with PMU and EHU: IC lavouting utilizing machine learning: Robots. ventilators, and smart wearables: EPIIC

R&D SOLUTIONS

300 M

Development of

reconfigurable,

self-healing,

batteryless

electronics;

Prototyping of

integrated and

and actuators;

technologies:

Establishment of

Integrated Circuits

....2021

linchpin

Center for

Research

and Devices

Development of

intelligent sensors

300 M

Development of

Development of

logic core device,

DRAM. Flash. and

NVM; Prototyping of

digital and handheld

assistance systems;

medical devices;

Development of

advanced driver

Establishment of

Laboratory

2023

concentrators

Oxygen

2022

Robot prototype

Printed electronics:

Wafer Fabrication

flexible electronics:

2025 Intelligent

200 M

emeraina

memory

devices:

cobots:

service

2024

devices and

novel logic

Prototyping of

Implementation

of robot-as-a-

Developmento

sensors and actuators: Prototypes for flexible electronics. logic core

Models for reconfigurable. self-healing, and batteryless device, DRAM, electronics: Flash, and Center for Integrated Circuits and Devices Research

NVM: Advanced driver assistance systems; Wafer Fab Lab

200 M

Development of

Bevond-CMOS

devices for MtM

Developmentor

smartphones,

smart batteries.

and chargers;

Prototyping of

components for

2026

Prototypes

for digital

handheld

medical

devices:

Cobots

and

autonomous

electronic

vehicles

applications;

Establishment of EPIIC