

XI. CONVERGENCE OF EMERGING TECHNOLOGIES / SECTORS TOWARDS INDUSTRY 4.0 AND SMARTER CITIES AND COMMUNITIES IN THE PHILIPPINES

A. SMART CITY CHALLENGE PH: Sustainability through Innovation in Cities in the Philippines

Call Rationale

The Department of Science and Technology aims to address challenges of urban and regional life in cities through the use of science, technology and innovation to enhance opportunities and address challenges relating to sustainable urban development against disasters.

Call Objectives

The DOST Smart and Sustainable Communities and Cities Framework aims to enhance research collaboration and to fund excellent research with lasting impact. The specific objective is to fully exploit the potential of the regions talent pool and maximize the benefits of an innovation- led economy with the following perspectives:

- Integration of different dimensions of urban sustainability in the framework of the UN Sustainable Development Goals.
- Co-production - a way to extend research activities to bridge gaps between knowledge, understanding, and action.

Considerations:

1. It should be based on standard sets of data LGUs produce to report in different offices (DILG mainly). These include financial report, PSA data, land use cover, infrastructure utilities, facilities, and amenities
2. Level of reliance, access and availability of data to make local leaders' decisions and plans, and for people to be aware and partake in the process
3. Should include the development of a web system to curate / manage, and visualize input data and assessment of results
4. Assessment of readiness should make references to technology in terms of 1) need of LGUs, 2) current level of use or access, 3) availability.

Call Priority Areas:

- Turning city vision to reality – using the smart city framework as toolkit of smart practices for managing governance, services, data and systems across the city in an open, collaborative, citizen-centric and digitally-enabled way.
- Integration of smart city indicators in the urban development plans / designs with the following themes:
 - i. Economic opportunity
 - ii. Education
 - iii. Environmental quality

- iv. Water and wastewater
- v. Energy
- vi. Finance
- vii. Governance
- viii. Health and living recreation
- ix. Safety, security and resilience
- x. Infrastructure
- xi. Transportation and mobility
- xii. Urban planning
- xiii. Empowerment and inclusion

Call Scope

1. Present a novel concept or mechanism; or
2. Case of immediate application must be presented;
3. The program integrator / proponent must come from the pilot cities in partnership with DOST Regional Office and Higher Education Institutions (HEIs) with proven capability to conduct R&D projects;
4. Endorsement from the local government unit is required;
5. Collaboration with an industry or government partner committed to provide counterpart funding is an advantage;
6. Provide details on the technologies to be used There is no limit to the number of technologies that may be used.
7. PCIEERD is interested in understanding the range of technologies that communities are considering as part of their applications to achieve perceived outcome(s). Cite available DOST technologies that can complement with the project.

Please refer to the linked document for reference - [DOST Framework for Smart Sustainable Communities and Cities](#)

PCIEERD will fund at most four (4) proposals for 10M per year per city.

B. Space Technology Applications (STA) in Public Services

Call Rationale

In the past years, DOST-PCIEERD funded various STA projects for disaster preparedness and mitigation, resources assessment (agriculture, coastal, forest, watersheds, and renewable energy), drought and crop assessment and forecasting to help enhance the mandated agencies in delivering key services for the Filipino people.

Call Objectives

Proposals should make use of space borne and/or remote sensing technologies like Geographic Information System (GIS), Global Navigation Satellite System (GNSS), Synthetic Aperture Radar (SAR), Light Detection and Ranging (LiDAR) for the following call scope or priority areas:

Call Scope

Proposals to be submitted should be aligned with the indicators specified under the DOST Smart City Framework including but not limited to the following priority topics:

- Enabler in Smart Sustainable Communities and Cities
 - Disaster risk management, response and rescue
 - Civil engineering works / infrastructure monitoring
 - Tax mapping
 - “Science of Where” of assets, resources, and service facilities
- Port and courier operations
- Sustainable Development Goals (SDG) monitoring

Requirements: Proposals should be submitted with a letter of support from the target beneficiaries or adoptors for sustainability. PCIEERD will fund at most five (5) projects with a budget of 5 Million per year per project.

The output of this directed research should be readily-deployable and replicable to other cities or LGUs at the end of its project implementation.

Please refer to the linked document for reference - [DOST Framework for Smart Sustainable Communities and Cities](#)

C. Development of 5G Products and Applications

Call Rationale

5G is a revolutionary technology envisioned that will eliminate the bounds of access, bandwidth, performance, and latency limitations on connectivity worldwide. 5G has the potential to enable fundamentally new applications, industries, and business models and dramatically improve quality of life around the world via unprecedented use cases that require high data-rate instantaneous communications, low latency, and massive connectivity for new applications for mobile, eHealth, autonomous vehicles, smart cities, smart homes, and the IoT (<https://futurenetworks.ieee.org/>).

Call Objectives

Proposals to be submitted should be aligned with the following priority areas:

- Development of 5G products/prototypes and applications aligned with the [DOST Framework for Smart Sustainable Communities and Cities](#)

Call Scope

Letter of support from partner institutions / industry should be secured and submitted together with the proposal.

D. Sensors and Actuators for Intelligent Factories

Call Rationale

Sensors and actuators are key building blocks of an intelligent industry – particularly in the manufacturing sector or so-called “Smart Factory”. In modern industries, IoT applications,

distributed sensors gather information about a system, which is then processed to form the basis for issuing commands to actuators that in turn, drive the system and processes. With faster computers, smarter machines, smaller sensors, cheaper data storage and transmission could make production segments and products smarter to communicate with and learn from each other through use internet-of-things (IoT) devices, Artificial Intelligence (AI) and Data Analytics techniques. Sensors and actuators technology, therefore have complementary roles in enabling manufacturing industries to attain efficiency, reduce errors and increase productivity. These innovations will transition traditional manufacturing processes founded on hierarchical automation systems, to self-organizing cyber-physical production system to allow flexible mass custom production and flexibility in production quantity.

Call Scope

PCIEERD, in line with its thrust to propel the Philippines to achieve its Industry 4.0 aspirations, is calling for research proposals to develop integrated sensor-actuator systems and technologies for sensor and actuator with decentralized controls and connectivity, sensor/actuator networks, streaming data analytics for optimal and adaptive manufacturing. The proposed project should be able to set up an intelligent, agile or reconfigurable and fully networked production line or subline that integrates physical input objects, machines, smart sensors, and demonstrate the application of manufacturing data analytics across the boundaries of organization.

This call intends to solicit proposals on the integration of intelligent sensor networks, coupled with AI, to improve existing systems and/or develop new services and breakthroughs in science as applied to Intelligent Factories.

Proposed projects must develop technologies on:

- **Sensors** (biosensing, biophotonic, chemical, optoelectronics, mechanical, thermal, micromechanics, magnetics. Sensor and sensor-array chemometrics, microarray)
- **Nano- or micromechanics and microcontrols;** actuators, structures, integrated sensors-actuators, microsystems, and other devices or subdevices ranging in size from millimeter to sub-micron- levels, nanomotors, microfluidic components nanomotors.
- **Systems and controls:** Interface electronics, chip-based detection devices i.e. biochips, lab-on-a-chip.
- **Machine vision** acting as the 'eyes' of the factory, image processing systems based on industrial cameras can compute information that was previously gathered and analysed by humans. It aids in the intelligent exchange of information among sensors, devices and machines.
- **Industrial Internet of Things, AI and Data Analytics** - Basis for issuing commands to actuators that in turn, drive the system. With faster computers, smarter machines, smaller sensors, cheaper data storage and transmission could make production segments and products smarter to communicate and learn from each other through the use of internet-of-things (IoT) devices, Artificial Intelligence (AI) and Data Analytics techniques.

Requirements: Proposals should be submitted with a letter of support from the target beneficiaries or adoptors for sustainability. PCIEERD will allocate a budget of 5-8 Million per project per year.