NEW INDICATORS FOR GRANTS-IN-AID PROGRAM for RESEARCH AND DEVELOPMENT

Old 6Ps	Retained *x* New Proposed Metrics (GII/QS/THE Indices)
I. PUBLICATIONS • Number Indexed Conference presentation • Number Local publication • Number International non-ISI publication • Number Scopus or ISI indexed publication • High impact factor journal publication	❑ **Number of ISI- and/or SCOPUS- indexed publications** ❑ **High impact factor journal publication** ❑ **Industry Article Citation Impact** (*i.e., the influence and impact)*
II. PATENTS • Number completed prior art search • Number Copyright and Trade Secret • Number patent application submitted • Number Utility Model granted • Number IP Patent granted • Valuation based on R&D and Tech Transfer	❑ **Total Patent Volume** (*registered under WIPO/ IPOPHL)* ❑ **Total Patent Success** (*i.e., the ratio of patent application to grants over the assessed timeframe*) ❑ **Number of Global Patents** (*i.e., the percentage of patents for which coverage was sought with the US, European and Japanese patent offices*) ❑ **Number of utility models** (filed and granted by WIPO/IPOPHL) ❑ **Patent Citations** (*i.e., total number of times a patent has been cited by other patents*) ❑ **Percent of Patents Cited** (*i.e., the proportion of patents cited by other patents one or more times*) ❑ **Number Utility Models filed** ❑ **Number of Utility Models granted** ❑ **Number IP Patents filed** ❑ **Number of Patents granted**

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III. PRODUCTS/ PROCESS
• Prototype produced with *valuation* done of the technology/product
  • Proof of Concept (TRL3)
  • TechTransfer (TRL4-5; IRL 1-5)
  • Prototype (TRL4-5)
  • TechTransfer for Commercialization (TRL 6-8, IRL 5-8)
• Product has acquired a licensing agreement with a private company
• Product is already commercialized
	❑ **R&D Ideation informed by industry, consumer, community, or market needs aligned with needs of industry**
	
	❑ **Technology Readiness**
	
	A. <u>Basic Research</u>:
	
	TRL 1: *Basic principles and research*: Do basic scientific principles support the concept? Has the technology development methodology or approach been developed?
	TRL 2: *Application formulated*: Are potential system applications identified? Are system components and the user interface at least partly described? Do preliminary analyses or experiments confirm that the application might meet the user need?
	TRL 3: *Proof of Concept*: Are system performance metrics established? Is system feasibility fully established? Do experiments or modeling and simulation validate performance predictions of system capability? Does the technology address a need or introduce an innovation in the field?

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	B. <u>Applied Research</u>:
	
	TRL 4: *Components validated in laboratory environment*: Are end-user requirements documented? Does a plausible draft integration plan exist, and is component compatibility demonstrated? Were individual components successfully tested in a laboratory environment (a fully controlled test environment where a limited number of critical functions are tested)?
	TRL 5: *Integrated components demonstrated in a laboratory environment*: Are external and internal system interfaces documented? Are target and minimum operational requirements developed? Is component integration demonstrated in a laboratory environment (i.e., fully controlled setting)?

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	C. <u>Development</u>:
	
	TRL 6: *Prototype system demonstrated in a relevant environment*: Is the operational environment (i.e., user community, physical environment, and input data characteristics, as appropriate) fully known? Was the prototype tested in a realistic and relevant environment outside the laboratory? Does the prototype satisfy all operational requirements when confronted with realistic problems?
	TRL 7: *Prototype demonstrated in operational environment*: Are available components representative of production components? Is the fully integrated prototype demonstrated in an operational environment (i.e., real-world conditions, including the user community)? Are all interfaces tested individually under stressed and anomalous conditions?
	TRL 8: *Technology proven in operational environment*: Are all system components form-, fit-, and function-compatible with each other and with the operational environment? Is the technology proven in an operational environment (i.e., meet target performance measures)? Was a rigorous test and evaluation process completed successfully? Does the technology meet its stated purpose and functionality as designed?

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	D. <u>Implementation</u>:
	
	TRL 9: *Technology refined and adopted, and commercialized*: Is the technology deployed in its intended operational environment? Is information about the technology disseminated to the user community/consumers/target markets? Is the technology adopted by the user community/ consumers/target markets?
	
	Investment and Market Readiness Level: Business Canvas to Regulatory Certainty and Plausible Exit

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	❑ **R&D leading to any of the following Tech Transfer to Commercialization Modalities:**
	a) Technology transfer licensing agreements
	b) Assignments of intellectual property rights
	c) Confidentiality agreements
	d) Collaborative research agreements
	e) Consultancy agreements
	f) Sponsored research agreement
	g) Material transfer agreements
	h) Contract research agreements
	i) Academic spin-off agreements
	j) University research-based start-up agreements
	k) Joint venture agreements
	
	❑ **R&D leading to Extension** (i.e., knowledge diffusion and skills transfer): Number of extension beneficiaries trained; Number of extension materials produced, products used by beneficiaries
	❑ **Integrated and used market, customer/user. trade, system requirement information in the R&D**
	❑ **Business canvas developed**
	❑ **R&D product is commercialized**

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IV. PEOPLE/SERVICES • Number of trained personnel in specialized fields of studies through workshops conducted • Addition to the scientific workforce by graduating science majors through the project (B.S., M.Sc. and Ph.D. degree holders) • Public service as adopted by a national agency or an LGU (e.g. reduction of flood levels along public roads)	❑ **Number of faculty provided support for graduate studies (MS/PhD)** ❑ **Number of faculty/ research staff provided support for continuing professional development** ❑ **Number of policies, policy recommendations, local and national legislative bills developed, filed, and passed** ❑ **Number of S&T MSMEs assisted through skills transfer + Peso Value of S&T SMEs** ❑ **Number of STI jobs created** ❑ **Number of S&T startups or enterprises created** ❑ **Number of extension beneficiaries trained, and extension materials produced**
V. PLACES AND PARTNERSHIPS • These are established laboratories, institutions and training programs -- • Number of TBIs, testing facilities, Institutional Development Partners and training programs.	❑ **Number of projects conducted jointly with industry** ❑ **Number of incubatees assisted by Technology Business Incubators** ❑ **Total investments or grants received by the startups under the Technology Business incubators** ❑ **Total Peso Value of industry-sponsored research expenditures** ❑ **Number of individual private sector entities funding research grants and contracts** ❑ **Number of industry collaborators** ❑ **Number of community-based collaborators** ❑ **Number of grants, contracts and sub-agreements from private sector entities** ❑ **Number of utility models commercialized/adopted by communities, LGUs, independent enterprises** ❑ **Number of projects conducted jointly with industry**

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VI. POLICIES • These are established laboratories, institutions and training programs -- • Number of TBIs, testing facilities, Institutional Development Partners and training programs.	❑ **Number of policies, policy recommendations, local and national legislative bills developed, filed, and passed**

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