

3rd Prize, Topic 1 Tertiary Category

Indus ++

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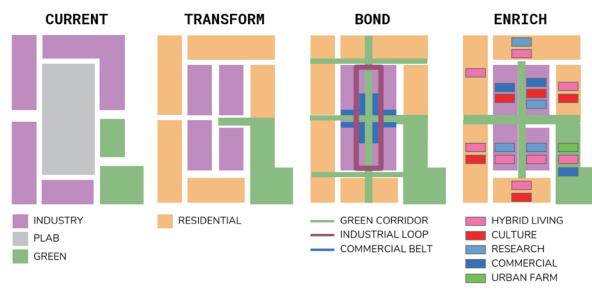
Zhu Shujie

JURY CITATION:

The jury commended the scheme for its strong vision for PLAB which is focused on creating a closed-loop of eco-industries to complement and strengthen the adjacent industrial hubs, and to provide a sizeable core of commerce and trade, recreation and culture, research and industrial collaboration to provide jobs for the surrounding residential towns. The jury also appreciated that the proposal is overlaid with a plan for renewable energy, waste management and food production to create self-sufficient communities. As well as how the residential areas are placed at the fringes such that they form a natural extension of the adjacent residential areas.

+ Singapore's Base for Eco-Industrial Development
+ Model for Food and Energy Self-Sufficient Communities in the East

CONCEPT PLAN



Industrial belt surrounding PLAB as barrier

Airbase at the centre dividing area into fragmented, mono-functional land uses

Lack of green linkages, connection to industries and commercial facilities

Need for new identity and enhancement of eco-industrial town

Transform the existing urban fabric (i.e. industrial, green and road network) in PLAB.

Relocate industries at the center for manufacturing loop, and low industrial land utilization with high output

Create an industrial loop between industrial and residential areas

New modes of living, producing while preserving cultural and built heritage

PROSPECT OF ECO-INDUSTRY

GLOBAL TRENDS



90 % of energy consumption comes from industry development. And.....
The energy demand will Increase in the future.

TRANSFORM
Through an Eco-industrial approach to development

NATIONAL ADVANTAGE

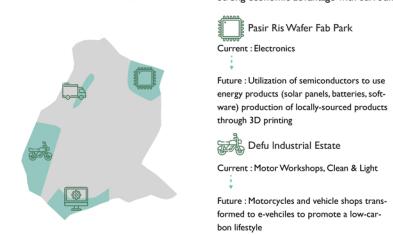


UPSCALE
Upscale the logistics and wafer fabs that provide smart transport for regional and national areas.

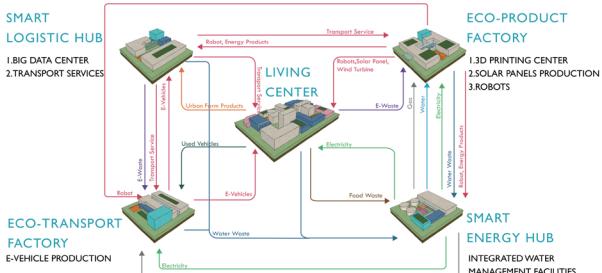
COLLABORATE
Collaborate with nearby industrial outputs and form a strong linkage to existing and proposed digital innovation districts.

POWER UP
Powering up the industry that caters to industrial needs for the site and serves the surrounding areas.

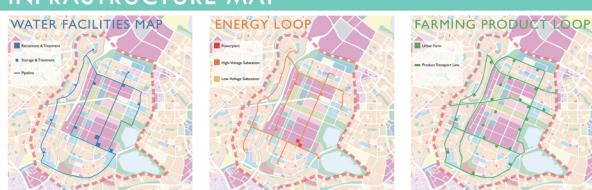
PAYA LEBAR AIRBASE



INTEGRATED CLOSED LOOP



INFRASTRUCTURE MAP



LAND USE PLAN 2050



GOALS



Reconfigured/upscaled industries developing in a closed loop



Thriving industries sustained by provision of solar energy in the East Region.



Self-sufficient communities designed to keep waste out of cities and produce food for Paya Lebar

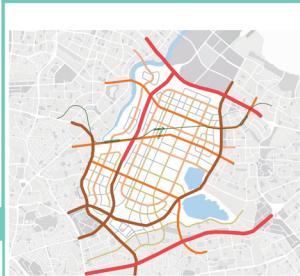


Intermeshing of industries and communities through provision of flexible open spaces

LAND USE TABLE

Legend	Land Use	Area (ha)	%	Legend	Land Use	Area (ha)	%
	Residential	534.14	28.58	E	Educational Institution	23.61	1.26
	Commercial & Residential	83.01	4.44	W	Place of Worship	6.12	0.32
	Business Park	50.95	2.73		Road	289.54	15.49
	Business I	212.03	11.35				
	Park	268.22	14.35				
	Open Space	48.67	2.60				
	Waterbody	176.84	9.46				
	Commercial	25.56	1.37				
	Mixed-use Community	100.02	5.35				
	Civic & Community Institution	26.54	1.42				
	Utility	5.37	0.28				
	Health & Medical Care	18.21	0.97				
	Total	1868.81	100.00				

ROAD HIERARCHY



GREEN CORRIDORS



2050 TARGETS

14% of land for industrial purposes
Low-land utilization, high output

20% of food provision to living centers

30% of food waste conversion to energy

97% of solar energy conversion to energy

URBAN DESIGN & SECTION

NEW ECO-PRODUCT FACTORY



MIXED-USE COMMUNITY



PARTICIPANTS' WRITE UP:

Indus ++: Singapore's Leading Eco-Industrial District

The proposal highlights a future where Singapore retains its status as having the most competitive economy by taking the lead in the 4th Industrial Revolution - or Industry 4.0. Under Industry 4.0, disruptive technologies will be introduced to support upscaling of existing industries. Industries currently operating under electronics and automation, as well as manufacturing and mass-production will be upgraded through the industrial Internet of Things (IOT), robots and artificial intelligence, which will transform the way we live. As boundaries between physical, digital, and social will be blurred, Paya Lebar Air Base (PLAB) will serve the niche market of sustainable industrial development.

Singapore's Base for Eco-Industrial Development

Already within Singapore, regions have banked on locational advantages to develop these industries. With the West region positioned as a *global port hub*, the North region banking on its proximity to Malaysia and emerging as a centre for *Agri-tech and Food*, the East and North-East region are well-positioned to contribute to Singapore's location as a *global aviation hub* due to its proximity to Changi Airport. At the regional level, these strengths of the East and North-East can be reinforced through the *high number of emerging industries* and planned industrial developments - making it a suitable base for industrial development.

Given that 90% of Singapore's current energy consumption comes from industries, increase in projected energy demand will be countered through the development of eco-industries operating in a closed-loop of resource, skills and product-sharing. PLAB's strong connectivity to surrounding industrial clusters provide the best opportunity to:

- 1 Upscale the logistics and wafer fabs (i.e. *Pasir Ris Wafer Fab* at the North-East);
- 2 Collaborate with nearby industries and form a strong linkage to existing and upcoming digital and innovation districts (i.e. *Punggol Digital District* and Logistics Park); and
- 3 Power up industries such as the *Kaki Bukit Industrial Estate* through clean energy industries (e.g. solar) to cater to the needs of the site and surrounding planning areas

Products developed within the closed-loop will be distributed through an underground tunnel with a conveyor belt for delivery, with additional space provision for e-vehicles in the future.

East's Clean Air and Solar Energy Source, Model for Self-Sufficient Food Production

With thriving industries at the core of the proposal, clusters will not only be physically linked to the industrial ecosystem at the national-level and through closed-loops within the site, but also be sustained and powered through solar energy, serving the whole East region. Water from the Bedok Reservoir will be converted by the site's Smart Energy Hub, transmitted and distributed underground at a lower voltage to distribute to industrial, housing and mixed-use areas.

Each living centre will be endowed with urban farms at the ground-level of residential areas and intensive rooftop farming in mixed-use areas, which operate simultaneously with solar panels to ensure growth of diverse plants and products. Self-sufficient communities will be designed to keep waste out of cities and produce food for Paya Lebar. Food waste will be

distributed through underground waste pipes installed in each farm - located meters away from the INDUS++ urban core.

Paya Lebar's Core: Culture, Commerce and Community

INDUS++ urban core will unify the symbiotic relationship between industrial and residential uses through an integrated physical loop - allowing culture, community and industry to come together organically. The PLAB runway will be repurposed as a green corridor, with a comprehensive pedestrian network stretching from the runway to the mixed-use urban core. The urban core will comprise of nodes for *commerce and trade, recreation and culture, research and industrial collaboration*, with open spaces utilized for plazas spaces, urban farming and sports and recreation facilities. These shall serve as an enabling environment for urban innovations to flourish, providing collaborative spaces for the community to thrive through the public and semi-public intimate spaces, which will also be used for ground-floor cultural and retail activities to revitalize Paya Lebar.

By 2050, Indus++ will be in the vanguard of eco-industry in Asia, producing food, energy and products in Singapore's East region and serving as the epitome of eco-living in Paya Lebar.