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VIETNAM BUSINESS FORUM

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VIETNAM'S SMART CITY INDUSTRIAL & ECONOMIC ZONES WITH CLEANER ENERGY EFFICIENCIES

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The development of smart greener IZ &EZ is adapted from the smart city concept, investing in smart cleaner technology improves operational efficiency.

The main stakeholders benefitting are IE/EZ developers, Businesses and Provincial Governments.

1. IZ/EZ competitiveness
2. Enhancing Environment
3. Businesses save operating costs
4. Improve GDP, employment, upgrade ecosystem, employment/middle class

Examples of additional developments in smart industrial estates

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Source: EIC analysis based on data from Kim and Wang (2014), Li et al. (2015), Zeng (2016)

Examples and benefits from using smart technologies

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Elements	Smart Technology	Benefits from each type of technology
Smart Living	I. Real-time crime map II. Emergency response optimization III. Disaster early-warning system	I. Reduce death rates by 3% and crime incidents by 10% II. Lower emergency response time by 20% III. Disaster risk reduction
Smart Mobility	I. Real-time connection between navigation and public transit information II. Smart traffic system III. Smart parking system	I. Reduce commuting time by 4% from route adjusts II. Reduce commuting time by 4% from lower traffic near intersections III. Reduce commuting time by 2% from parking identification
Smart Governance	I. Digital business licensing and building permit request II. Digital business tax filing III. Digital citizen services	I. II. III. Reduce delays arising from government process
Smart Energy	I. Water consumption tracking and quality monitoring II. Electricity distribution automation system	I. Reduce water consumption by 15-25% II. Increase stability and efficiency in energy consumption
Smart Environment	I. Building energy management system II. Digital tracking and payment for waste disposal	I. Reduce GHG emissions by 3% from improved heating, cooling, and lighting systems II. Reduce unrecyclable waste by 15%
Smart People	I. Online capability enhancement curriculum II. Online retraining programs III. Local e-career services	I. Increase quantity of skilled labor II. Increase labor force efficiency
Smart Economy	I. Online capability enhancement curriculum II. Online retraining programs III. Online retraining programs	I. Drive innovation II. Develop new entrepreneurs III. Labor can adapt to new career paths

Source: Mckinsey&Company, Neirotti et al. (2014)

SUSTAINABLE DEVELOPMENT GOALS

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SUSTAINABLE DEVELOPMENT STRATEGY

Eco-Industrial Park initiatives

Eco-Industrial Park Vietnam

Target: symbiosis between industrial development and environment

SUSTAINABLE DEVELOPMENT STRATEGY

Eco-Industrial Park initiatives: plastic road

- In cooperation with DOW Chemicals Viet Nam
- Initial test phase of 200m in DEEP C HP III, extended to 1400m in DEEP C HP II in November 2019
- Target: use 20% plastic waste (can be extended in later phases) to cover the surface of road

SUSTAINABLE DEVELOPMENT STRATEGY

Eco-Industrial Park initiatives: Preserver mangrove preservation and Green Zones

- Replacing green zone
- Reduced dyke designs & flooding buffer area
- Recreational area for local population

SUSTAINABLE DEVELOPMENT STRATEGY

Eco-Industrial Park initiatives: renewable energy

- Lowering carbon footprint
- Driving sustainable sourcing of energy
- Encouraging local renewable energy industry

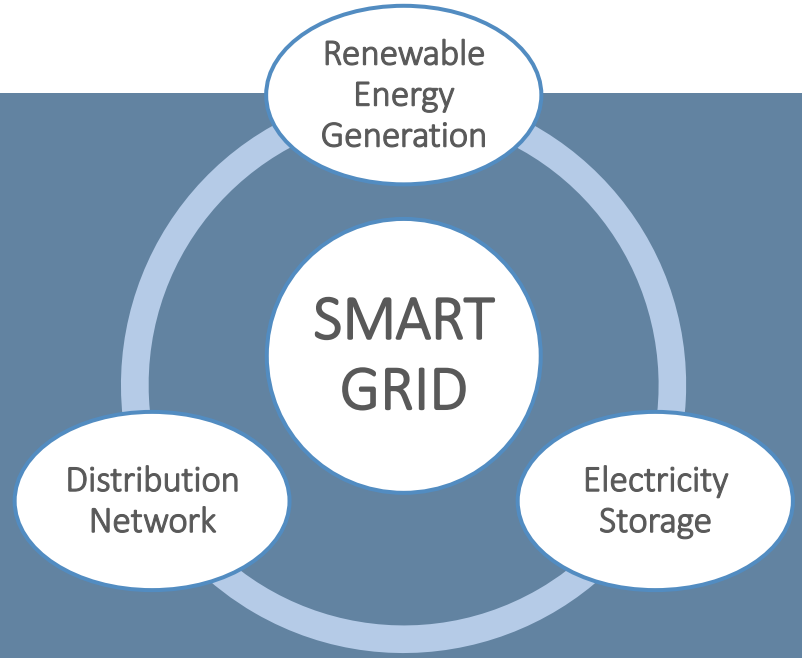
Rooftop solar & wind at Arcelor Mittal Belgium
Adapted from PV Magazine, 2019

Solar test installation from 2017

Wind measurement mast from 2018

RENEWABLE ENERGY STRATEGY

- **Renewable energy generation:**
  - Solar rooftop projects on roofs of tenants' factories
  - Solar ground projects on free land/water areas
  - On-shore (and possibly off-shore) turbines
- **Distribution network:** reducing impact from future load increases on EVN network by connecting renewables directly to grid and distributing to the IZ's tenants
- **Electricity storage (future):** batteries for energy overproduction



RENEWABLE ENERGY STRATEGY

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EVN

Coal-fired and hydroelectricity

No feedback to grid

Solar projects

Battery and/or pumped hydro storage

Wind projects

DEEP C HYBRID POWER GRID

DEEP C Hai Phong I
98 MVA

DEEP C Hai Phong II +
121 MVA

DEEP C Hai Phong III
97.5 MVA

DEEP C Quang Ninh I + II
315 MVA

Excessive power for electric vehicles on IZs and/or hybrid transport barge

Target: supply 50% of DEEP C's electricity demand with renewable energy by 2030

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- IZ/EZ with their own greener power generation and grid are attractive to both FDI's and Vietnamese businesses.
- Cleaner smart energy is a demand now by major FDI's to meet their own Corporate Carbon Reduction Policy.
- IZ/EZ need to be able to offer cleaner smarter energy and grid.
    1. Mixture of clean energy such as LNG with Renewables.
    2. Utilizing industrial rooftops.
    3. Proving piped gas as well as containerized LNG
    4. Outcome sustainable lower cost greener energy

LEGAL SITUATION

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Previous guidance from MoIT

- Rooftop solar projects < 1 MW connected to the local electricity grid are **not** bound to PDP approval and application for power generation license.
- Rooftop solar projects > 1 MW or wind projects connected to the local electricity grid are bound to PDP approval and application for power generation license, even if the electricity is consumed 100% within the local electricity grid.
- Power generated on the grounds of the industrial / Economic zones can only be sold to the local electricity grid in case it comes from rooftop solar projects < 1 MW.
- The retail power price for electricity generated by the local electricity grid company for customers on the industrial / Economic zones is bound to yearly approval, even if EVN standard tariffs are followed.

Open questions

- Does a grid connection agreement and/or PPA with EVN still need to be signed if all electricity will be consumed internally and provided by IZ/EZ?
- Do IZ/EZ need to apply for yearly permission from ERAV when applying EVN standard retail tariffs to its consumers for electricity it purchases from the IZ/EZ?
- What about storage projects? Can they be developed and used to smoothen the load of the industrial zone?
- Will the government of Viet Nam take steps to encourage green finance mechanisms?

BENEFITS

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What's in it for Viet Nam?

- DEEP C business case proves potential for micro-grid implementation in IZ/EZ:
  - As infrastructure is still developing, innovative technology can be used from the start
  - Viet Nam can become a regional leader by relaxing regulatory barriers for (partly) self-contained systems
- Reducing dependency and required investment by EVN:
  - Freeing up generation capacity
  - Positive impact on transmission and distribution development
- Lowering impact on the environment by reducing emissions and fossil fuel use
- Lowering Viet Nam's dependence on external energy resources

THANK YOU FOR YOUR ATTENTION!

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