REVIEW OF REGULATIONS RELATING TO THE DEVELOPMENT OF A FLOATING SOLAR POWER PLANT (PLTS) IN A FLOATING AREA

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OUTLINE

PRELIMINARY

TECHNICAL STUDY

CASE STUDY AND EXPERIENCE

CONCLUSIONS AND SUGGESTIONS

Why Choose Solar Power Plant?????

Technique Aspect : **Reservoir O & M, Water Conservacy, PV System, Risk Of Failure**

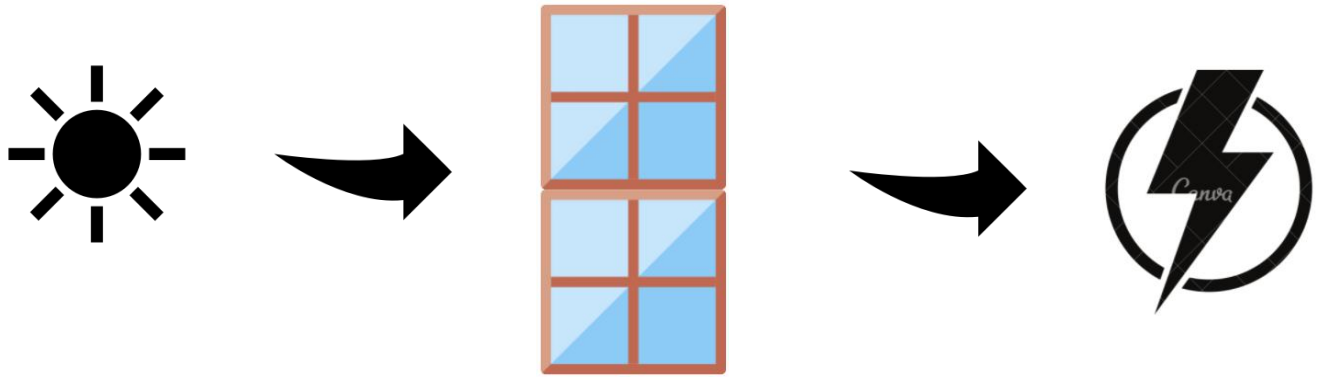
Environmental Aspect : **GHG Emission , Water Quality, Potential Ecological Impact**

Economy Aspect : **Levelized Cost Of Electricity, Net Present Value, Payback Period , Internal Rate of Return**

Resources : Ecadin 2021

SOLAR POWER POWER PLANT

SOLAR POWER POWER PLANT is one of the technology generation electricity use cell Sun (Photovoltaic, PV) for change Ray Sun Becomes Ray electricity.



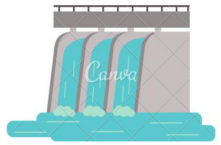
FLOATING SOLAR POWER PLANT (PLTS)

PLTS Floating is generator electricity which use power Sun and installed in reservoir.

THE POTENTIAL OF FLOATING PLTS IN INDONESIA

2/3 Territory Indonesia in the form of waters

Indonesia has potency energy Sun which the radiation Sun average 4.8 Wh/m^2



The Quantity dam in Indonesia are 244 dam (registered in Dam and Lakes's Directorate in August 2020)

The Large *reservoir* around ±108.183 hectares.

PRESENT CONDIITION

Utilization area reservoir:

tourist, water sport and fishery land limited.

there is still the other opportunity for utilise reservoir, there is potency generator electricity power Sun (PLTS).

Regulation The Ministry of Public Works and Housing No.6 year 2020

PURPOSE AND OBJECTIVES

Special Study

study and review on the application of the regulation ministry PUPR No. 6 Year 2020 on water storage dams in Indonesia, so that it can be expected as a sharing of scientific insights that can provide optimal impact for the use of reservoirs, both single-purpose and multipurpose, in Indonesia

Aim

a. Implementation of the PUPR Ministerial Regulation Number 6/PRT/M/2020, particularly floating solar power plants;
b. Optimizing the utilization of the potential of sunlight in inundation reservoirs;
c. Optimizing the use of new, renewable energy that is environmentally friendly (green energy).

TECHNICAL STUDY

The main legal basis is the Regulation of the Minister of Public Works and Public Housing of the Republic of Indonesia Number 6/PRT/M/2020 concerning Amendments to the Regulation of the Minister of Public Works and Public Housing Number 27/PRT/M/2015 concerning Dams.

It is stated that the surface area of the reservoir inundation area that can be used for floating solar power plants is determined based on the results of technical and environmental studies by the dam manager so that the percentage value of 5% in the Regulation of the Minister of Public Works and Public Housing of the Republic of Indonesia Number 6/PRT/M/2020 concerning Amendments to the Regulation of the Minister of Public Works and Public Housing Number 27/PRT/M/2015 concerning Dams need to be reviewed.

Based on ICOLD, there is no specific limitation from ICOLD on the *coverage ratio* of reservoir surface use for PV mini-grid. ICOLD cannot confirm and recommend the *maximum coverage ratio* for reservoirs in general, because the ratio can be <1% or >70% depending on the size and condition as well as the impact study (source: PT. Krakatau Tirta Industri, 2021

CASE STUDY AND EXPERIENCE

Until now in Indonesia has been no carry out activities to utilize reservoir inundation areas, especially for PLTS.
References used are several dams and their reservoirs located abroad

	Sungrow Solar Farm	Anhui, GCL's Floating PV	Bombhofpla	Omega 1
Location	Huanian, China	Anhui, China	Zwolle, Netherlands	Piolenc, France
Capacity	40 MW	32.6 MW	27.4 MW	17 MW
Ratio Area	21.5%	20%	30%	34%
Year Operation	2017	January, 2018	March, 2020	October, 2019

(source: PT. Krakatau Tirta Industri, 2021)

Location	Higahsimatsuyama, Japan	Yakamura, Japan	Awa, Tokushima, Japan	CMIC Pond, Cambodia
Capacity	7.5 MWp	13.7 MW	1.6 MWp	2.8 Wp
Total area Surface Water	13 ha	18 Ha	2.7 Ha	2.7 Ha
Ratio Area	57%	30%	45%	74%
Year Operation	October, 2015	March, 2018	July, 2017	March, 2019

(source: PT. Krakatau Tirta Industri, 2021)

CONCLUSION

Side Positive PLTS Floating

1. •Does not require new land acquisition, because it utilizes water bodies so that it adds value to the building;
2. •Produces higher energy when compared to PLTS on land without the need for cooling and closer to the *Hydro power plant;*
3. a.3 •Savings in reducing water by evaporation during the dry season;

CONCLUSION

Challenge PLTS Floating

1. •Need to attention dam safety, social and environmental rules
2. •Installation *anchors* of strong so that they are not lifted during high tides;
3. a.3 •Impact on changes in water elevation due to flooding and sediments
4. a.4 •Energy utilization solar power at night, how to take advantage of the surplus energy from PLTS.
5. • Must need operation and maintenance intens

Suggestion

No	Beginning	Become
1	The surface area of the reservoir inundation area that can be used for floating solar power plants is a maximum of 5% (five percent) of the surface area of the reservoir inundation at normal water levels,	a. surface area of the reservoir inundation area that can be used for floating solar power plants is a maximum of 5% (five percent) of the surface area of the reservoir at normal water level **b. The surface area of the reservoir inundation area can be more than 5% of the surface area of the reservoir inundation at normal water levels, if based on the results of technical and environmental studies by the dam manager, it does not have a negative impact on the environment and safety of the dam;**

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