



# INDONESIA CLEAN ENERGY TECHNOLOGY : ENERGY STORAGE FOR SMART GRID AND ELECTRIC VEHICLE

IEA WORKING-LEVEL DIALOGUE  
Jakarta, 30-09 2021

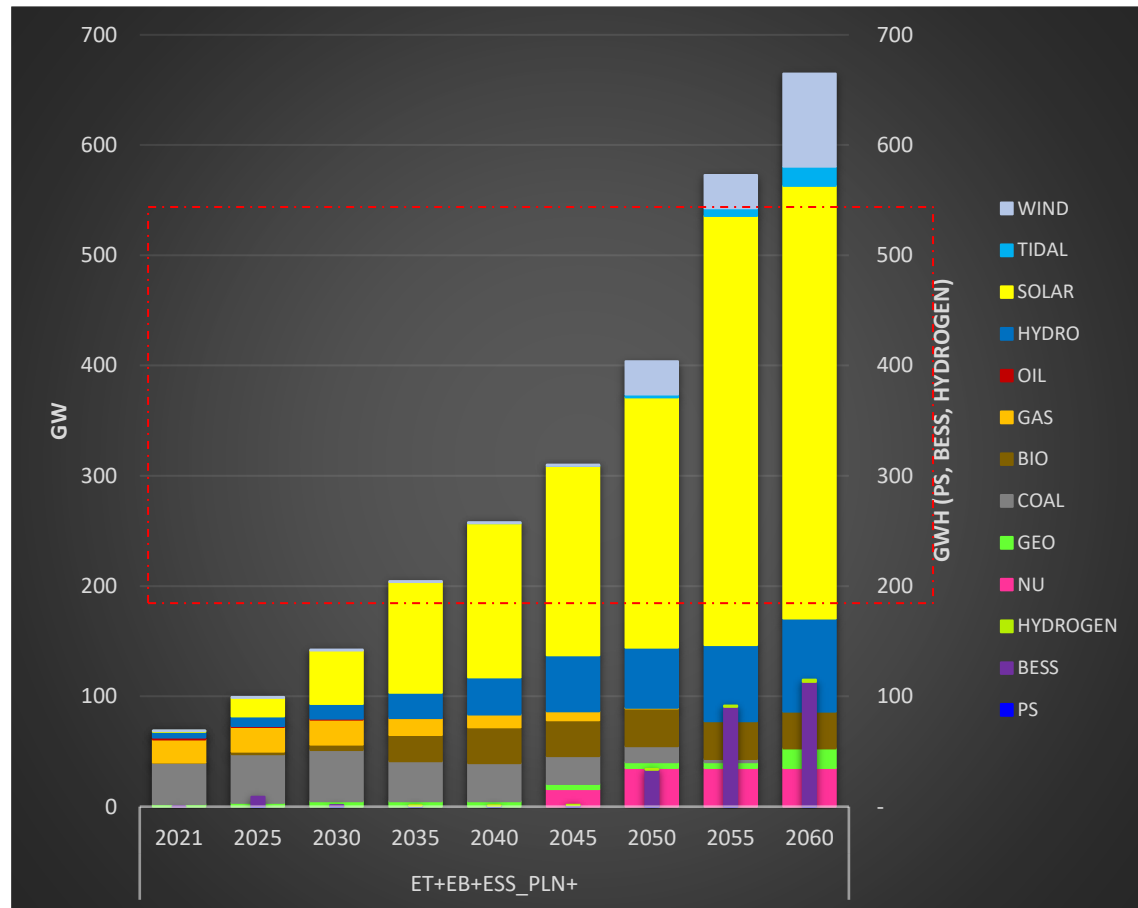
**Ministry of Energy and Mineral Resources**  
**Agency of Research and Development for Energy and Mineral Resources**  
**Republic of Indonesia**



# INTRODUCTION

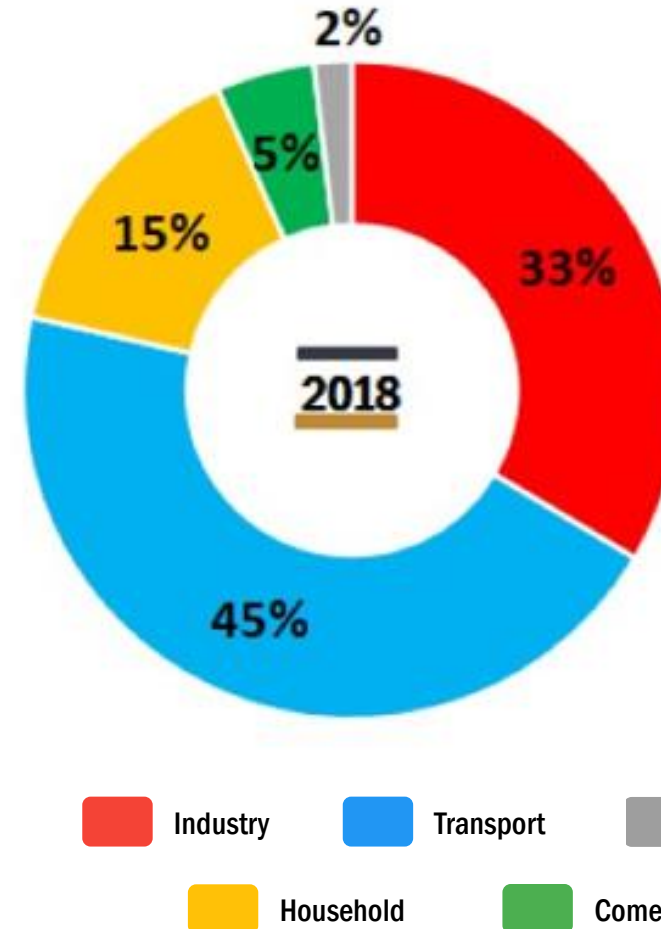
- To achieve the Target of NDC 2030 and NZE which are estimated to be in 2060, it is necessary to support clean energy technology
- From the energy supply side, the priority is how to accelerate the achievement of the renewable energy mix, which will be dominated by variable renewable energy (solar energy).
- From the energy demand side, the transport sector is the largest user of energy which is expected to shift from using fuel oil to electricity (EV)

# ENERGY SUPPLY AND DEMAND SIDE



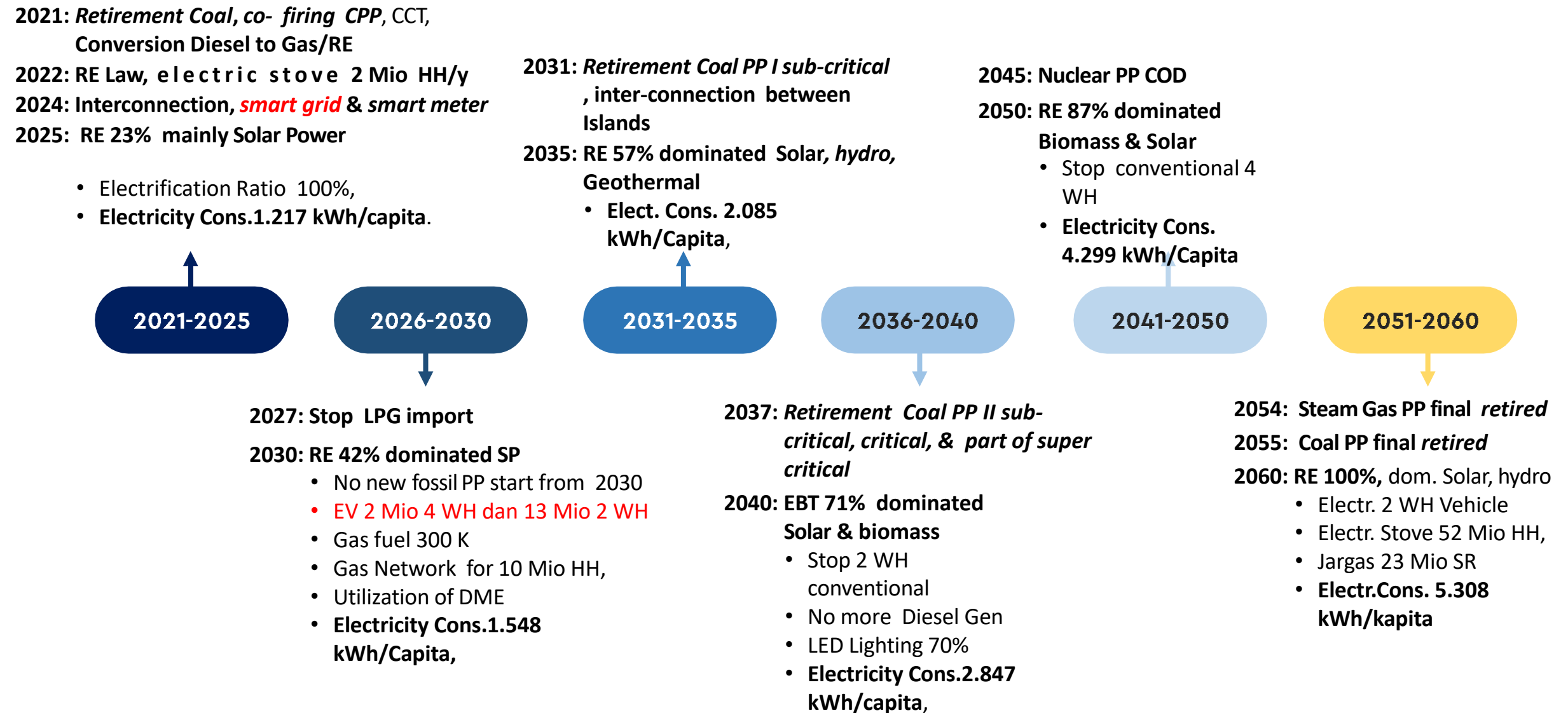
The projected energy production in 2060 will be 1,800 TWh.

NRE mix in 2060 will be 100% with composition Solar power plant 59%, hydro power plant 12.7%, wind power plant 12.6% , nuclear power plant 5.2%, biomass power plant 33 GW, geothermal power plant 18 GW, ocean current power plant 18 GW



the transportation sector is currently the largest energy consumer, so the target is to reduce the use of fuel oil into electricity (EV)

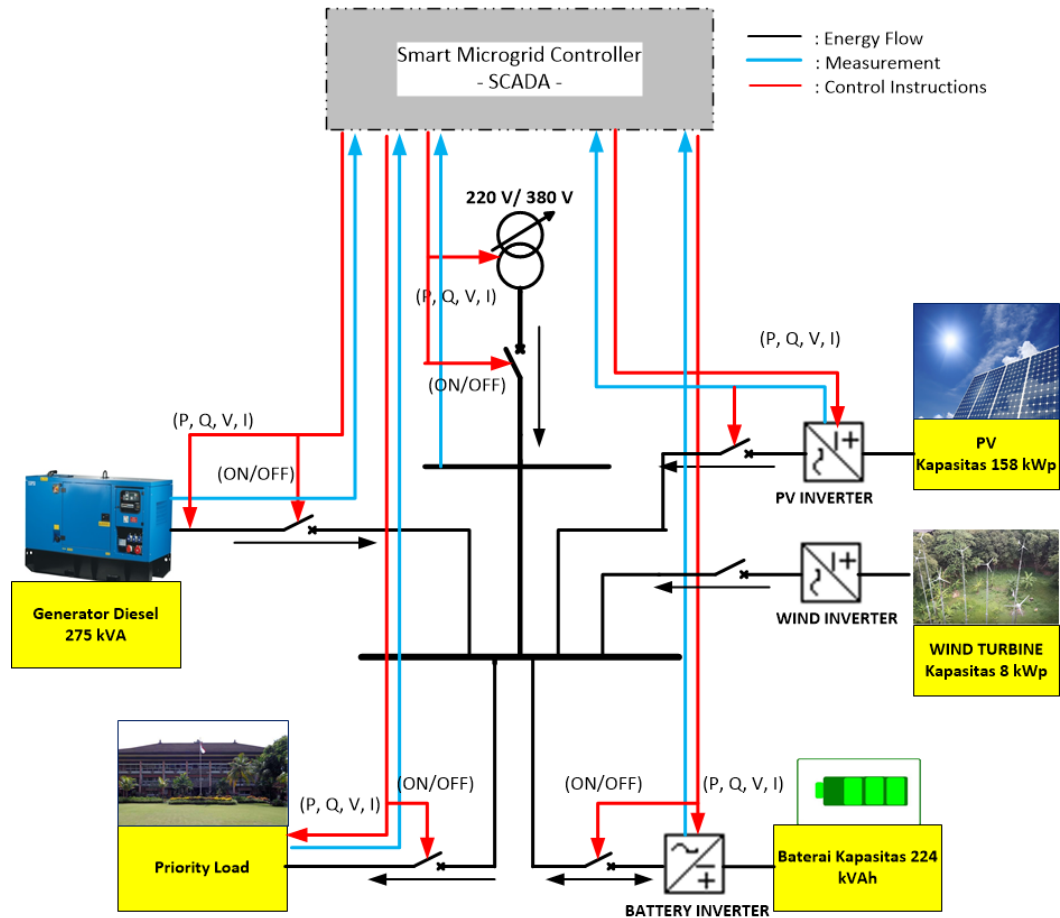
# ROAD MAP OF INDONESIA'S ENERGY TRANSITION TOWARD NEUTRAL CARBON



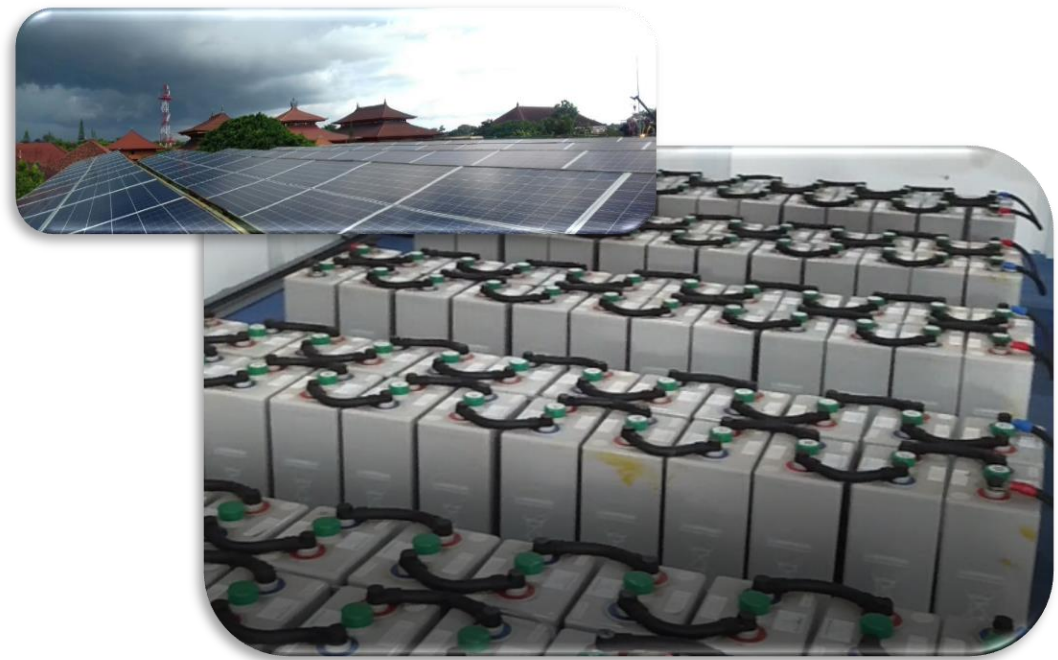
# ENERGY STORAGE: FOR SMART (MICRO) GRID AND EV

- The priority of clean energy technology in Indonesia is how technology can help in fulfilling clean energy based on renewable energy / renewable energy variables
- In addition, the next priority is on the demand side, where the application of electric vehicles is the focus for achieving net zero emission
- These two priorities, it leads to the use of the same technology, namely regarding energy storage, both on the supply side and on the demand side

# SMART (MICRO) GRID



energy storage plays an important role in the smart grid system, the problem of energy storage prices which are still quite high is an obstacle in implementing the smart grid system





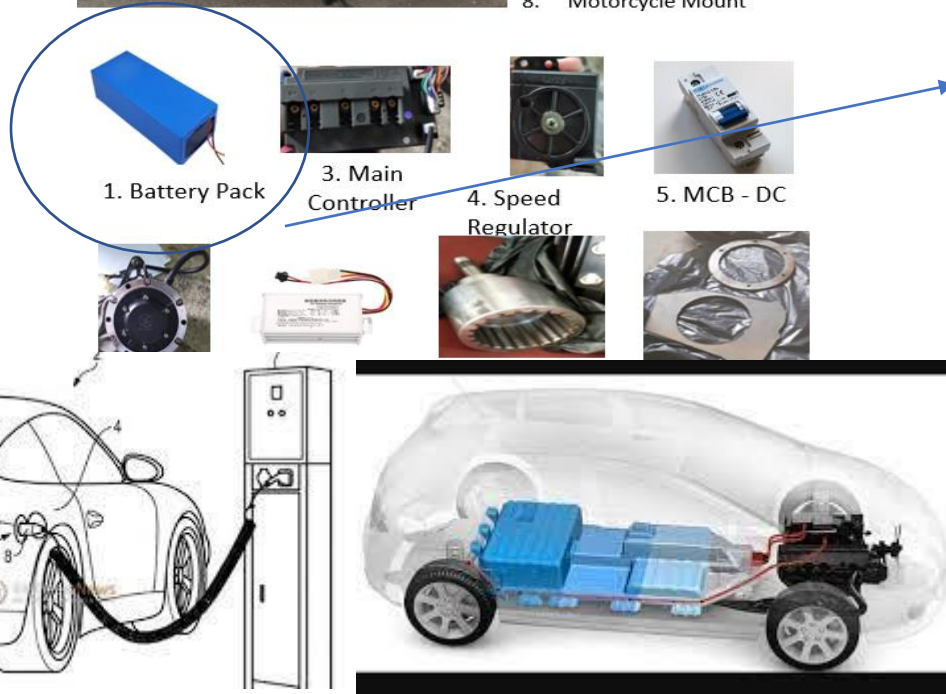
# APPLICATION OF ELECTRIC VEHICLES

Grand Strategy Energy Nasional (GSEN)  
2021-2040

	jumlah kendaraan (unit)		konsumsi energi (Juta KL)		konsumsi energi (Gwh)	
	2030	2040	2030	2040	2030	2040
	2,2	9,5 (juta)	2,8	12,2	3969	17159
	13	42,7 (juta)	2	6,6	3973	13043



1. Battery Pack; 72/20Ah
2. Motor listrik; 2 kW
3. Main Controller; Max current 100A
4. Speed Regulator and Battery Indicator
5. MCB –DC; 40-60 A
6. DC Converter ; 72V to 12V
7. Motorcycle Converter to CVT
8. Motorcycle Mount



On the energy user side: the implementation of EV is constrained by the price of energy storage which is still quite high

Currently the EV implementation program in Indonesia: for 2-wheeler EV is to convert IC motorcycles into electric motorcycles. Around 130 Mio units exist in the community, and the growth of ICs motor cycle is around 6-7 Mio per year

# CLOSING REMARKS

- For the application of clean energy based on NRE, solar power plant acceleration needs to be carried out where this energy source is abundantly available
- The problem of implementing VRE and EV is almost the same, namely in energy storage which needs to be found a solution related to the performance and price
- Interest cooperation : development of economical energy storage/battery based on local resources (nickel or others) and application of potential Renewable Energy for the energy mix in Indonesia





# Thank You

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