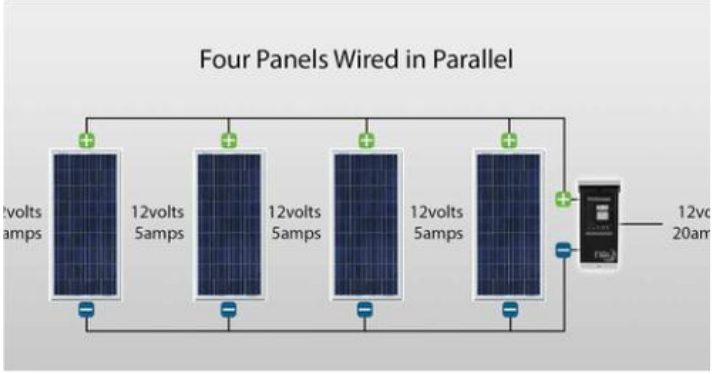
Comparison of Modular system Micro Inverters Vs. Traditional Central String Inverters

Both string or series inverters and parallel micro inverters convert solar DC current output to the normal AC current and both allow excess solar power to be fed back to the grid for PLN to use. With string or series inverters, the panels are connected in series using ONE big central inverter for the whole system (see diagram below).

Modular System - Micro Inverters

Micro Inverters use panels connected in a Parallel circuits - Solar panels in Parallel:
The current in a parallel circuit has multiple paths on which to travel and only flows through one load. So if one panel in the system fails current will continue to flow through alternative paths so the failed panel does not affect any of the other panel's output.
This is unlike the traditional central string inverters with panels in series, where if one panel fails, they ALL fail.
From the diagram of the current running along the entire wiring system in a parallel circuit is additive while the voltage remains constant. So for example if a solar system has 10 solar panels each rated at 12 volts and 5 amps, the entire system would have a voltage of 12 volts and 50 amps



(see diagram)
So,for ON-Grid or grid-tied systems the preferred installation is solar panels connected in parallel using micro inverters.

Traditional Central String Inverter Systems

Central String Inverters use panels connected in Series circuits – **Solar panels in Series**

There are 2 major disadvantages with the Central String Inverter system:

1. **Less use of Suns rays:** if ANY one of the panels fail, becomes faulty OR comes under shade then the output of ALL the other panels matches the output of the faulty or failed panel. (ie the panel with the lowest output).
2. **Potential Fire Risk**: High Voltage gives risk to high temperatures which gives risk of arcing which gives risk of fire!

Solar Panel - Shadow or Bird Poo Effect

https://youtu.be/z41P2KGHpVI

Conclusion:
When using micro inverters, (ie panels in parallel as in first example) every panel has their very own individual inverter which means that if one panel has a problem it does not affect the output of any of the other panels.
This can result in a huge difference in the nett usage of the sun's energy. In certain areas and certain conditions the output of AC power of a solar panel system over one year using micro inverters can be as much as 50% higher compared to a system using string or series inverters.

INVERTERS

Central Inverter
(1 per solar *system*)

or

Micro-inverter
(1 per solar *panel*)

The string series system uses one single big central inverter per system. This can cause a few problems, like high DC voltage. While the modular parallel system uses 1 tiny micro inverter per panel.