# Realization of a low carbon society through game changing technologies

**Pb-free perovskite solar cells consisting of Sn**

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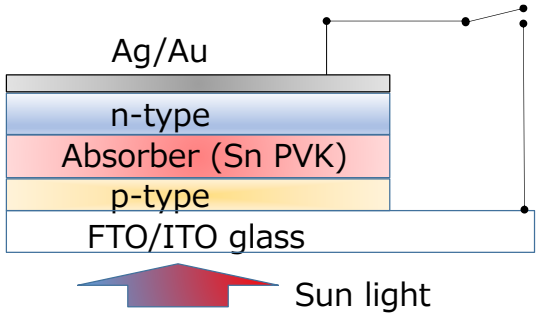
**Summary :**

- Problem: One of the bottle necks for previous PVK-PV is to contain Pb. One of the most expected PVK is Sn-perovskite. However, the efficiency was low.
- Solution: Enhancement of efficiency for Sn-perovskite solar cells by band engineering and defect less structure.
- Expected decrease in $CO_2$ emission: $1.2 \times 10^{14}$ g/year after 10% of solar cells is replaced.




Structure of Pb free PVK solar cells with Sn

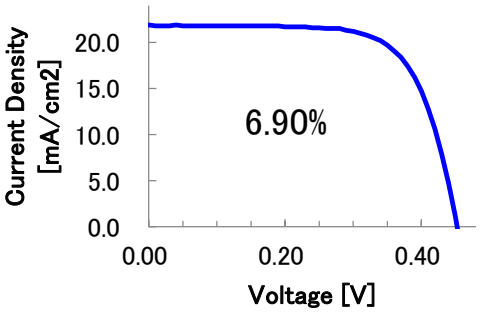



Photo-voltaic performance for Sn-PVK cell