# Electronic Supplementary Information

## Synergies and compromises between charge and energy transfers in three-component organic solar cells

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### Photovoltaic measurements

Table S1 shows the photovoltaic performances of three P3HT:F8BT/PCBM devices with different weight ratio between P3HT and F8BT.

**Table S1** Photovoltaic parameters of different P3HT:F8BT/PCBM solar cells

| | P3HT:F8BT/PCBM | | | |
|---|---|---|---|---|
| **Ratio (wt) P3HT:F8BT** | $V_{oc}$ **(V)** | $J_{sc}$ **(mA/cm²)** | ***FF*** | **% η** |
| ***1:1*** | 0.30 | 0.22 | **0.40** | 0.03 |
| ***3:1*** | **0.57** | **1.99** | 0.30 | **0.35** |
| ***10:1*** | 0.40 | 1.35 | 0.30 | 0.16 |

Table S2 shows the photovoltaic performances of three tc-$PHJ_2$-like structure devices with different thickness of F8BT layer at the interface between P3HT and PCBM.

**Table S2** Photovoltaic parameters of different tc-$PHJ_2$– like structure solar cells. The F8BT amount is expressed as its concentration in the starting solution

| | tc-$PHJ_2$ | | | |
|---|---|---|---|---|
| **Concentration of F8BT** | $V_{oc}$ **(V)** | $J_{sc}$ **(mA/cm²)** | ***FF*** | **% η** |
| ***0.10 mg/ml*** | 0.60 | **2.21** | **0.38** | **0.50** |
| ***1.25 mg/ml*** | 0.72 | 0.81 | 0.32 | 0.19 |
| ***2.50 mg/ml*** | **0.74** | 0.10 | 0.16 | 0.01 |