Supporting Information:

Flux synthesis and thermoelectric properties of eco-friendly Sb doped Mg$_2$Si$_{0.5}$Sn$_{0.5}$ solid solution for energy harvesting

Hongli Gao, Tiejun Zhu*, Luxin Chen, Xinxin Liu, Xinbing Zhao

State Key Laboratory of Silicon Materials and Department of Materials Science and Engineering, Zhejiang University, Hangzhou 310027, China

Figure S1. XRD patterns of flux synthesized Mg$_2$Si$_{0.4-x}$Sb$_x$Sn$_{0.6}$ alloys.
Figure S2. Carrier thermal conductivity for Mg$_{2}$Si$_{0.5}$Sn$_{0.5}$Sb$_{x}$ samples.

Figure S3. Temperature dependence of ZT of the flux synthesized Mg$_{2}$Si$_{0.4-x}$SbxSn$_{0.6}$ alloys.

Figure S4. TG curve for the Mg$_{2}$Si$_{0.483}$Sn$_{0.5}$Sb$_{0.017}$ sample.
Figure S5. A large size of flux synthesized Mg$_2$Si$_{0.5}$Sn$_{0.5}$ based alloys showing the scale-up capability of the method. The ingot is about 15 g compared to usual 3g of products in this work due to a larger crucible used.