

## Environmental Impacts of an Increase in Cooling Demands in Thailand: Evidences and Mitigation Measures

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**Abstract** – It is expected that the cooling demand will triple in Asia in 2050 due to socioeconomic and climate changes. This can have serious environmental consequences. Unless a sustainable pattern of consumption and production is developed, the use of air conditioners (ACs) in households will result in pollutions: greenhouse gases, ozone-depleting substances and electronic waste (e-waste). By 2050, half of the e-waste generated in Thailand will be old ACs. Results from this research collaboration underpin the significance of this driver. Even in the Northernmost Province of Chiang Rai, the demand for ACs is increasing. This study finds that households in urban areas had more ACs and used them in many more hours than rural households that began to embrace the technology. Student surveys further shows that the next generation of homeowners tend to take air conditioning for grant as the large majority had enjoyed it at home and in school. To mitigate the impacts, stakeholders identified several measures to improve the efficiency of cooling appliances such as standards and labelling, green procurement, and education on energy saving. Other measures at a system level like a switch to renewable energy and urban planning to lessen an urban heat island were also discussed. The study also explores the possibility of technology transfer in the form of a zero-energy house (ZEH) from Japan to Thailand that can potentially offer co-benefits in terms of health promotion and quality housing.

**Keywords:** air conditioning; climate change; ozone depletion; electronic waste; zero-energy house