

Abstract No: A-057

HAZE AND PEATLANDS: THE TOP THREE CHALLENGES OF TACKLING SMOULDERING MEGAFIRES

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One again, peat fires raged in 2015 in Indonesia and their extent was staggering. They emitted in excess of 1.6 Gton of CO₂ equivalent. In fact, if peat fire emissions were considered, Indonesia would be the 3rd or 4th highest emitting country in the world. Smouldering fires are the largest and longest burning fires on Earth and take place in Indonesia, Siberia, Alaska, Florida and Australia, to name a few. Peat megafires destroy essential peatland ecosystems, and release very large quantities of CO₂, CO and CH₄, making up 15% of annual global greenhouse gas emissions. Moreover, the burning of deep peat affects older soil carbon that has not been part of the active carbon cycle for centuries to millennia, and thus creates a positive feedback to the climate system. Given the scale of the problem, relatively little action is being taken. After 15 years of research on the topic, I have identified the three major challenges hampering global action: Scientific Understanding is poor: There are still large gaps in our knowledge of how smouldering fires ignite and spread, which impedes development of any successful mitigation strategy. Poor scientific knowledge even leads to disastrous confusion between flaming and smouldering combustion. Non-existent technologies: Smouldering fires are routinely fought across the globe with techniques that were developed for flaming fires. These techniques are ineffective. For instance, aerial tankers do nothing to stop smouldering fires, and satellite monitoring substantially underestimates the size of peat fires. Topic fragmented among disciplines: Smouldering fires are an intrinsically multidisciplinary theme requiring collaboration by combustion scientists, ecologists, atmosphere scientists and biochemists. These three challenges must be overcome before effective mitigation strategies can be implemented. While the largest fires on Earth continue releasing naturally stored carbon into the atmosphere, we are failing to protect both people and the planet.

Keywords: -