付録 ①：ELFに対する定義と表現

Phrasing and defining of environmental leapfrogging

Sources	Phrasing and defining
Goldemberg (1998)	…developing countries have a fundamental choice: …or they can *leapfrog* over some of the steps originally followed by industrialized countries, and incorporate currently-available modern and efficient technologies into their development process.
Murphy (2001)	There is renewed optimism about the potential for *leapfrogging* in the rural energy sector of East Africa. By adopting highly efficient and renewable technologies many believe the region can rapidly bypass the conventional path of energy development and skip directly into the use of more efficient and environmentally friendly technologies.
UNEP (2002)	Cleaner Production provides developing countries and countries undergoing economic transition an ideal opportunity to *'leapfrog'* over the past environmental mistakes of industrialised countries while at the same time enabling their industries to become more economically efficient and competitive by reducing inefficiencies, waste and material costs.
Perkins (2003)	developing countries need not adopt the dirty technologies of the past. Rather, they might well be able to *"leapfrog"* over them, opting instead for modern, clean technologies as an integral part of capacity addition. …will enable developing countries to avoid repeating the past experience of today's developed economies, and their path to industrialization with its legacy of environmental blight. Moreover, by *leapfrogging* straight to cleaner production paradigms from the outset, developing countries may also be able to avoid getting "locked" into hydrocarbon intensive technologies and infrastructures, as has happened to industrialized economies.
Jochem & Madlener (2003)	It is quite obvious that a large *leapfrogging* potential exists, which could create large ancillary benefits/co-benefits, and which could be reaped by adjusting the foreign trade regime in a way that the most obsolete technologies must not be traded internationally any more.
Ho (2008)	"Doing it right the first time" – by installing clean, efficient technologies as well as developing the institutional capacity and the appropriate governance style to enforce environmental regulations – could lead to *"leapfrogging"* the development process and building industrial economies that are both

	competitive and more sustainable than those of economies with an older industrial base.
Gallagher (2006)	(Elaborated eloquently by Goldemberg (1998) and others) …industrializing countries can avoid the resource-intensive pattern of economic and energy development by *leapfrogging* to the most advanced energy technologies available, rather than following the same path of conventional energy development that was forged by the highly industrialized countries.
Unruh & Carrillo-Hermosilla (2006)	developing countries can potentially *"leapfrog"* industrial country experiences and move directly to low or zero carbon energy systems. Leapfrogging, in essence, allows developing countries to skip over the historic development phases that industrial countries have passed through and move directly to state-of-the-science technologies.
IPCC (2007)	The ability of developing countries to bypass intermediate technologies and jump straight to advanced clean technologies. *Leapfrogging* can enable developing countries to move to a low emissions development trajectory.
Lewis (2007)	Energy *leapfrogging* has been described as a strategy for developing countries to shift away from an energy development path that relies on traditional energy sources, such as fossil fuels, and onto a new path that incorporates the broad utilization of advanced energy technologies—generally those that have been developed within more industrially advanced countries. As a means of climate change mitigation, observers have argued that developing countries need not adopt the dirty technologies of the past— rather, they can *"leapfrog"* over them, opting instead for modern, clean technologies as an integral part of capacity additions (Goldemberg 1998)
Ockwell, et al. (2007)	(as outlined in Goldemberg (1998))…developing countries can *leapfrog* over the resource and energy intensive steps to industrialisation taken by developed countries by adopting modern, energy efficient technologies. Rather than going through a series of incremental technology changes, they could move straight forward into adopting the most advanced available technologies.
Ockwell, et al. (2010)	Incremental innovation has often played a critical role in instances of assumed technology *"leapfrogging"* in developing countries, where countries have moved towards, and then surpassed the international technological frontier.
Walz (2010)	it is argued that NICs do not necessarily have to follow the emissions path of the industrialized countries. An alternative development path can be labeled "tunneling through the EKC" or *"leapfrogging."* … Developing countries

	could draw on the experience of industrialized countries allowing them to leapfrog to the latest sustainability technology.
Watson & Sauter (2011)	*"environmental leapfrogging"* – both in industrial development and in the adoption of cutting-edge technologies – could prevent latecomer countries from going through the same pollution-intensive stages of industrial development as industrialized countries as experienced in the past.

出所： (Gallagher, 2006; Goldemberg, 1998; Ho, 2008; IPCC, 2007; Jochem & Madlener, 2003; Lewis, 2007; Murphy, 2001; Ockwell, et al., 2007; Ockwell, et al., 2010; Perkins, 2003; United Nations Environment Programme, 2002; Unruh & Carrillo-Hermosilla, 2006; Walz, 2010; Watson & Sauter, 2011)、 筆者整理。