2nd International Symposium on
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Future Energy Needs and Engineering Reality

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In reviewing the past 20 years in the context of plans to decarbonize the global economy, there is a serious lack of engineering reality assessment. Here I extract ten lessons from new technology introductions over the last 200 years and apply them to the decarbonisation project.

1. New energy technologies improve the lot of mankind.
2. The scale of the decarbonisation problem is unprecedented.
3. Tackle megacities first.
4. Only deploy new energy technologies when they are mature and economic.
5. Salutary lessons from the first round of renewables technologies.
6. Subsidies for premature rollout are a recipe for disaster.
7. Technology developments are not usually pre-programmable.
8. Nothing will happen if the population is not trusting.
9. Finance is limited, so actions at scale must be prioritised.
10. If the climate imperative weakens, so does the decarbonisation.

I then consider three practical propositions:

1. Work within business as usual with focus on efficient use of energy.
2. Derisk infrastructure projects.
3. Public attitudes and personal behaviour are much the most effective place to work now.

No-one yet factors in the demographic consideration of peak population predicted for the period 2050-70 so that much new infrastructure may be needed for only 100 years at most.

Much of the investment over the last 30 years will be written off: we simply must be more sophisticated in our approach to decarbonisation than we have been to date.

Keywords:decarbonization, technology, energy

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未来能源需求和工程实际

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回顾全球经济减碳计划实施的过去 20 年，发现存在着严重缺乏工程实际评估的现象。在这里，通过对过去两百年来新技术的采用，我总结了十个教训，并将其应用到减碳项目中。

一、新能源技术使人类生活水平提高了很多。
二、减碳问题的规模是空前的。
三、首先是如何处理好超级城市。
四、只有当新能源技术成熟且经济可行时，才考虑部署实施。
五、从第一轮可再生能源技术的实施中获取的有益经验教训。
六、过早推出补贴会导致灾难。
七、技术发展通常是不可预先程式化的。
八、如果民众不信任，那么什么都不会发生。
九、金融条件是有限的，所以大规模的行动必须优先考虑。
十、如果气候变化的紧急度减弱，减碳的紧急度也当相应减弱。

然后我考虑三个实用的建议：

一、业务照常进行，将重点放在能源的高效利用。
二、减小基础设施项目的风险。
三、很多工作的最有效之处应放在解决公众态度和个人行为上。

预测 2050-70 年人口将达到峰值。尚未考虑任何人口方面的因素，因此许多新的基础设施可能仅需要最多百年的时间。

很多过去三十年的投资将被注销：在低碳化处理方面我们需要比现今考虑得更完全一些。

关键词：减碳，科技，能源