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2. CHEN T. Y., LAI P. Y. A comparative study of energy utilization efficiency between Taiwan and China. *Energ. Policy.* **38** (5), 2386, **2010**.
3. HEPPEL M., ZHONG C. J. Functional nanoparticles for bioanalysis, nanomedicine and bioelectronics devices. ACS symposium series; 1112, USA, **2012**.

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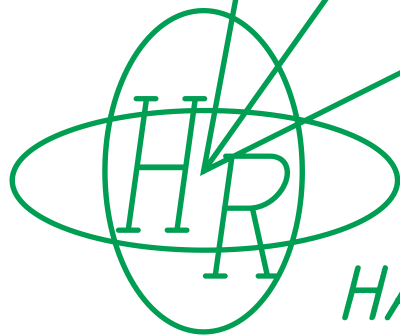
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2. CHEN T. Y., LAI P. Y. A comparative study of energy utilization efficiency between Taiwan and China. *Energ. Policy.* **38** (5), 2386, **2010**.
3. HEPPEL M., ZHONG C. J. Functional nanoparticles for bioanalysis, nanomedicine and bioelectronics devices. ACS symposium series; 1112, USA, **2012**.

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