Nuclear Power in Vietnam: challenges and alternatives

The twelve categories of life-cycle cost not included in overnight costs estimates

- **Costs for establishing a policy framework**: This includes costs ranging from setting up independent control agencies on a national level to specialised auditors working on the ground, as mentioned earlier.
- **Costs for financing the project**: These are international loans and interest repayments. Most countries exporting nuclear technology (such as France, Japan or Russia) are currently facing economic difficulties, and are therefore unlikely to grant financially beneficial contracts for client countries. Apart from that, it should be highlighted that there are international loans for the construction of reactors, but no international loans for dismantling or waste storage, which could exceed the construction costs.
- **Costs for buying the nuclear fuel**: Especially in this regard, Vietnam will always be dependent on the prices set by the global market. The contracts should regulate which country will cover the costs for transportation of the fuel to Vietnam, including all necessary safety measures for the transport.
- **Costs for operating the reactor for its lifetime**: This includes the cost for technical equipment, as well as for human resources. The investment contract should clearly regulate whether any of those costs are covered by the investor, and if so, for what time span.
- **Costs for maintenance**: As indicated above, all reactor types regularly have to be taken off the grid for several months, and energy security for the country has to be secured by other means.
- **Costs for training specialised personnel**: Staff at the reactor other nuclear facilities (waste storage, etc.,) need to be trained. As mentioned earlier, only highly skilled personnel, who, at least for the first decade, will have to be trained abroad, will be able to work in those facilities.
- **Costs for emergency preparedness and for informing the public**: This includes costs for training specialised personnel for emergency situations, and for developing emergency plans, as well as for informing the public and local decision makers, as mentioned in part two. Those costs will arise at all nuclear sites (reactors, waste storage, and all transport routes for radioactive material).
- **Costs for insurance against possible accidents**: However, no insurance company worldwide will fully cover the costs arising from accidents, and for the compensation costs listed in part two.
- **Costs for securing all nuclear sites against terrorist activities**: Those are costs for policing and safeguarding all nuclear material against theft, and for securing all facilities against possible attacks (which is, however, not even fully technically feasible for most reactors today).
- **Costs for the decommissioning of reactors**: These are typically equivalent to the construction costs. Unlike parts from a wind turbine or from a coal power plants,
most parts of nuclear reactors are radioactive, and cannot be sold or recycled, but have to be dismantled very carefully (often by robots, as it would be too dangerous for humans), and stored as nuclear waste.

- **Costs for transporting radioactive materials to waste storage**: Nuclear waste has to be transported in appropriate secure containers, for which the necessary infrastructure (safe roads or railways) have to be in place.
- **Costs for storing nuclear waste**: Nuclear waste must be securely stored for more than 244 000 years\(^3\). Internationally, no long term storage for high-level nuclear waste has been found. There is some waste storage solution for low- and medium level-waste, which, however, are in most cases far more costly than previously estimated. Even the low-level wastes have to be insulated from the environment for hundreds of years.

See the full article.