

# Ten Reasons Why the World Bank Should Not Finance the Nam Theun 2 Power Company in Lao PDR

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## A DEMAND-SIDE ANALYSIS

- #1 PROPONENTS HAVE FAILED TO DEMONSTRATE NAM THEUN 2'S ECONOMIC VIABILITY
- #2 NAM THEUN 2 IS VIABLE ONLY BY MONOPOLY
- #3 NAM THEUN 2 HAS NO MARKET DEMAND
- #4 NAM THEUN 2 IS PART OF EGAT'S HIGH-RISK MONOPOLY EXPANSION
- #5 THE NAM THEUN 2 DEAL REMAINS SECRET, NOT SUBJECT TO REGULATORY OVERSIGHT OR COMPETITIVE BIDDING IN THAILAND OR LAO PDR
- #6 WORLD BANK EXPERTS ARE ON RECORD WARNING AGAINST UNCOMPETITIVE POWER PURCHASE DEALS (LIKE NAM THEUN 2)
- #7 NAM THEUN 2 WOULD SINK ELECTRICITÉ DU LAOS FURTHER INTO DEBT
- #8 RURAL COMMUNITIES IN LAO PDR WOULD BE BETTER SERVED BY INVESTMENTS IN CHEAPER OFF-GRID TECHNOLOGIES
- #9 NAM THEUN 2'S OUTPUT IS MORE COSTLY AND LESS ECONOMICALLY VALUABLE THAN GAS-FIRED COMBINED CYCLE PLANTS AND DECENTRALIZED SUPPLY OPTIONS IN TERMS OF RELIABILITY, OPERATING FLEXIBILITY, AND SECURITY OF SUPPLY
- #10 THAI POWER CONSUMERS AND CITIZENS GROUPS WANT UTILITY REFORM



## Probe International's Interest

Probe International is a Toronto-based citizens' group investigating the economic and environmental effects of Canadian aid and companies in developing countries. Probe International is a division of the Energy Probe Research Foundation, Canada's leading power consumer advocacy group for utility reform and the democratic regulation of electricity markets.

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## Probe International's Message

Probe International argues against Canadian or World Bank support for the Nam Theun 2 hydropower project in Lao PDR because the project represents a costly, unnecessary, unreliable, and environmentally damaging addition to Thailand's power system. World Bank funding would not serve as a hand up to the rural poor of Lao PDR, as its proponents claim. Instead, it would give the French and Thai power monopolists behind the Nam Theun 2 Power Company a hand out at the expense of Thai ratepayers, the rural poor in Lao PDR, the environment, and the economy. The people of Lao PDR and Thailand would be better served by democratic utility reform and investment in cleaner, higher-value, and lower-cost generating technologies. Bank financing for the Nam Theun 2 power deal would: ensure the Thai power market is over-supplied with artificially cheap power; discourage investment in higher-value, lower-cost generating options; and sink Electricité du Laos further into debt. It would also send the wrong signal to investors and utilities that monopoly self-dealing still drives electricity investment decisions in the region, rather than consumer demands, technological advances, and public acceptability.

### A Lost Decade in Lao PDR: The World Bank and the Nam Theun 2 Hydro Project

The World Bank is expected to decide this year whether or not to finance one of the largest and

most controversial hydro projects in Southeast Asia, the proposed US\$1.1 billion<sup>1</sup> Nam Theun 2 dam in Lao PDR. Officially, the Bank is "months away from any final decision on whether we can support the project or not," according to a Bank spokesperson.<sup>2</sup> However, Loy Chansavat, a Laotian advisor to the Nam Theun 2 Power Company, reports that the Bank is likely to approve financing by early 2005.<sup>3</sup> Construction is expected to start mid-2005.

After years without a market or investors, the Nam Theun 2 Power Company led by French utility giant, Electricité de France, signed an agreement last November to sell the dam's output to Thailand's electricity generating authority (EGAT). The 25-year deal, worth an estimated US\$6 billion, commits EGAT to purchase 995 megawatts for an average price of 4.15 US cents per kilowatt-hour starting in 2010.<sup>4</sup>

Led by Electricité de France with its 35 percent stake, the Nam Theun 2 Power Company includes the Electricity Generating Company, the private subsidiary of Thailand's national power company, Electricity Generating Authority of Thailand, Ital-Thai Development, Thailand's largest construction company, and the national power company of Lao PDR, Electricité du Laos. The company's technical advisor is PB Power, part of the New York-based Parsons Brinckerhoff engineering group.<sup>5</sup>

Financing Nam Theun 2 has been a stumbling block for the developers over the last decade. Two-thirds of

the project revenue is to go to the dam's French and Thai developers yet they have been unwilling to risk their capital and will not be able to attract commercial financing, unless the World Bank provides a political risk guarantee and subsidies to help defray the dam's high social and environmental costs.

To protect would-be Nam Theun 2 investors, the World Bank approved a special guarantee mechanism in 1997 following nearly two years of discussion with the Nam Theun 2 consortium (at that time led by Australian engineering giant, Transfield). If the guarantee is applied, the World Bank would pay commercial lenders a portion (i.e., US\$100 million) of what they are owed by the Nam Theun 2 Power Company in the event it cannot service its debts due to war, civil disturbances, expropriation, violation of concession contracts or other forms of government interference.<sup>6</sup> The Bank is also considering a loan between \$20 and \$30 million to cover part of the social and environmental program costs.<sup>7</sup>

Without protection and subsidies, commercial banks and Western export credit agencies are reluctant to risk their capital on a billion-dollar partnership with a bankrupt and formerly communist regime. As Paul Cargill of Mallesons Stephen Jacque, the Lao PDR government's lawyers, explains: "we all know where and what Laos is. . . . When [investors] look for the Lao legal system (being the laws themselves and the courts that apply and interpret those laws), they see an underdeveloped system which does not

give them comfort that once they put their money in they can get it out.”<sup>8</sup>

If the World Bank decides to support the project, it expects the Nam Theun 2 Power Company to raise \$270 million from Western export credit agencies, \$375 million in commercial loans from Thai banks, and \$107 million in loans from commercial banks in developed countries.<sup>9</sup> In a statement last year, the chairman of Electricité de France Southeast Asia said he expects financing to come from the World Bank, Asian Development Bank, European Investment Bank, Agence Française de Développement, as well as export credit agencies, and commercial banks.<sup>10</sup>

The Thai government has hinted that project financing could be arranged without the World Bank, on the strength of EGAT’s 25-year deal with the Nam Theun 2 Power Company. Thailand’s energy minister, Prommin Lertsuridej, said that financing could be raised through Asia bonds and China’s Development Bank, while EGAT’s governor told press that Chinese dam-building companies have expressed an interest in financing the project.<sup>11</sup> EGAT’s governor, Sitthiporn Ratanophas, and Foreign Minister, Surakiart Sathirathai, were assigned by the Thai government to help raise financing.

Though there has been no open political debate in Lao PDR, the billion-dollar hydro export scheme has generated public controversy in neighbouring Thailand and in

World Bank-donor countries. One of the first concerns is that Lao PDR, one of the world’s poorest countries, could lose far more than its government expects to gain. If built, the dam would displace at least 5,600 people and flood almost 500 square kilometers of highland plateau.<sup>12</sup> It would disrupt fisheries and farming along the Xe Bang Fai, a major tributary of the Mekong. And it would deprive another 5,000 ethnic minority highlanders of their traditional land and forest resources because the government has declared the dam’s watershed a national biodiversity conservation area.<sup>13</sup>

Proponents insist they would mitigate environmental damages and that nobody would be left worse off after the project’s completion. But the record of large hydro dams suggests quite the opposite, say critics, including Probe International. An Asian Development Bank study of the Lao PDR power sector reports serious unresolved problems at earlier hydro export projects.<sup>14</sup> Across the Mekong in northeast Thailand, thousands of villagers are still suffering the loss of their migratory fish stocks, which were destroyed by the last World Bank-financed hydro dam built a decade ago. Even where political will exists to mitigate ecosystem damages, past efforts have met with “limited success,” according to a global review of large dams by the UN-backed World Commission on Dams.<sup>15</sup> The Commission reported that “it is not possible to mitigate many of the impacts of reservoir creation on terrestrial ecosystems and biodiversity, and efforts to ‘rescue’ wildlife

have met with little sustainable success.”<sup>16</sup> As for fisheries, “the use of fish passes to mitigate the blockage of migratory fish has had little success, as the technology has often not been tailored to specific sites and species.”<sup>17</sup> More often than not, the Commission found that large dams have destroyed fisheries and downstream floodplains, which are so vital for agriculture.<sup>18</sup>

Even the World Bank, a longtime proponent of Nam Theun 2, has its doubts about the project’s viability. “Unless these negative impacts are carefully mitigated,” said the Bank’s Nam Theun 2 Project Director, Jayashankar Shivakumar, “the net benefits flowing from the project may not be attractive enough to justify it.”<sup>19</sup> To compensate for the project’s negative impacts, the Bank wants the Laotian government to use its share of the dam’s revenue for poverty alleviation and conservation programs, and borrow more money from the Bank to help defray some of the Company’s social and environmental costs.<sup>20</sup> The Bank has appealed to other donor agencies for subsidies: Speaking at a 2002 donors conference in Vientiane, Shivakumar said that Nam Theun 2 would need “substantial external support, through grants (to finance the government’s contribution to equity in the project), export credits, financial transfers, and technical assistance from donors other than the Bank.”<sup>21</sup> The Bank wants to see “concrete performance” on poverty reduction and forest conservation from the Lao PDR government, as well as “broad support from international donors and civil society”

before it will consider funding.<sup>22</sup> International NGO involvement, says Shivakumar, would provide the Bank with “much-needed comfort that the environmental and social issues relating to the project will be successfully managed.”<sup>23</sup>

No hydro project in the world has received as much attention from the World Bank as Nam Theun 2. On his trip to Lao PDR in 2003, the World Bank’s Managing Director, Shengman Zhang, said: “We see Nam Theun 2 not as a project *per se* but as a vehicle through which to make a considerable progress in the effort of poverty reduction.”<sup>24</sup> Government of Lao PDR (GoL) officials say the government is committed to using its portion of the dam’s revenues – an estimated \$80 million annually for 25 years – to reduce poverty.<sup>25</sup> The power company, for its part, has pledged one million US dollars annually for managing the forests surrounding the dam’s reservoir. The 4,300-square kilometre area of “world class biodiversity heritage,” which has been designated the Nakai-Nam Theun National Biodiversity Conservation Area, “will be entirely protected thanks to partial funding” from the company.<sup>26</sup>

At least 30 World Bank staff and consultants have been involved in project planning since 1994.<sup>27</sup> During that time, poverty in the project area has worsened due to military-backed logging and a government ban on traditional rice cultivation and hunting.<sup>28</sup> The Bank has dispatched countless teams from Washington DC to Vientiane, which are then flown by military

helicopter to the remote dam site near the Vietnamese border. In 1995, it advised the GoL to hire six consulting firms to help the developers prepare for the Bank’s appraisal process. The consultants were: Seatec International (Thailand), Acres International (Canada), Norplan (Norway), the World Union for Conservation of Nature (IUCN), Wildlife Conservation Society (USA), Lahmeyer International (Germany), Worley International (New Zealand), and Louis Berger International (USA).

To ensure the “strictest possible monitoring according to the World Bank’s guidelines in matters of dam building,” the Bank commissioned three panels of experts: an international advisory group, a panel of social and environmental experts, and a dam safety panel of experts, to monitor the project’s development.<sup>29</sup> The Bank also helped the GoL hire legal and technical advisors, and helped draft the project’s legal framework, including the power purchase agreement, and the 1,200-page concession agreement, which was signed by the GoL and the Nam Theun 2 Power Company.

### **Ten Reasons Why the World Bank Should Not Finance the Nam Theun 2 Power Company in Lao PDR**

#### **1 Proponents Have Failed to Demonstrate Nam Theun 2’s Economic Viability**

The only valid reason for building any kind of power plant is to economically serve a particular power

market or set of customers at a price acceptable to both the producers and consumers. When proponents refuse to demonstrate economic viability, when they do not openly and honestly account for environmental liabilities, this should signal to investors and the public that the proposed project is not viable and the project should be abandoned.

In the case of Nam Theun 2, proponents have failed to demonstrate the project’s economic viability. The last economic analysis commissioned by the government of Lao PDR (GoL) was conducted in 1997 by Washington-based consultants, Louis Berger International. That study concluded that Nam Theun 2 would need to sell its output for an average price of 5.75 US cents per kilowatt-hour (starting in 2004) in order to cover estimated costs and earn a fair return for Lao PDR. That’s almost 40 percent higher than the price negotiated by the Nam Theun 2 Power Company in 2003 (4.15 US cents per kilowatt-hour).<sup>30</sup>

Generating an up-to-date economic analysis of Nam Theun 2 is the Bank’s responsibility, according to Nam Theun 2 Project Director, Jean Delvallet.<sup>31</sup> But when asked earlier this year, a spokesperson for the Bank said that it would be “premature” to come to any conclusions about whether the project is economically viable for Lao PDR.<sup>32</sup>

## 2 Nam Theun 2 is Viable Only By Monopoly

Nam Theun 2 proponents claim the dam is ‘competitive’ with Thailand’s cheapest and cleanest source of power: gas-fired combined cycle plants. But this is not accurate. EGAT data indicates that Nam Theun 2 would cost the utility 4.4 US cents per kilowatt-hour, including the investment cost of extending the northeastern Thai grid to the Lao border.<sup>33</sup> That’s more than what EGAT pays a number of gas-fired power producers in Thailand. For example, power from a 700-megawatt gas-fired combined cycle plant owned by Independent Power (Thailand), the country’s first licensed Independent Power Producer (IPP) costs EGAT 3.86 US cents per kilowatt-hour, including transmission.<sup>34</sup> Power from Tri Energy’s 700-MW combined cycle plant, including transmission, costs EGAT 3.96 US cents per kilowatt-hour.<sup>35</sup> Elsewhere in the region, gas-fired independent power producers sell their output to Electricity of Vietnam Corporation, for about 4 US cents per kilowatt-hour, less than the price of output for Nam Theun 2.<sup>36</sup>

The World Bank and EGAT claim that Nam Theun 2 power will be needed by 2010, even with the addition of new small power producers. This is misleading. Less than one percent of the new capacity proposed under Thailand’s Power Development Plan for 2003 to 2016 is expected to come from Small Power Producers.<sup>37</sup> The actual potential new capacity from SPPs is about 4,000 MW or more than four

times the planned capacity of Nam Theun 2, according to Thai energy ministry data.<sup>38</sup> Of this 4,000 MW excluded from the PDP, 2,700 MW is mostly gas-fired SPPs and another 1,540 MW is ready-to-build renewable energy projects (including municipal solid waste-to-energy, small hydro, solar, and wind).<sup>39</sup>

Rather than encourage domestic investment in these cleaner, more economically valuable options, however, the Thai government has allowed EGAT to negotiate the Nam Theun 2 deal for its own benefit and its subsidiary, EGCO. The UK-based *Financial Times* recognized EGAT’s self-dealing habit earlier this year, saying that EGAT is “using political muscle to restrict competing generators and push through projects whatever the social and environmental costs.”<sup>40</sup>

## 3 Nam Theun 2 Has No Market Demand

The World Bank defends EGAT’s rationale for buying Nam Theun 2 power as follows:

*“According to the Thailand Load Forecast Sub-Committee (which includes a large group of industry stakeholders who either produce or consume electricity), Thailand’s base case demand for electricity will grow approximately six percent per year over the remainder of the decade. This includes allowances for demand side management. Based on EGAT’s existing capacity, planned capacity additions (which include Small Power Producers, SPPs), planned capacity retirements, and power supply reliability criteria by the time NT2 would be commissioned in 2010, EGAT will fully absorb its 995 MW allocation*

*[EGAT’s 2004 version of its PDP includes 920 MW from Nam Theun 2 not 995 MW] within that year. The generation reserve margin which is currently high would have come down to the normally accepted level of 15 percent by 2010.”*<sup>41</sup>

The World Bank’s interpretation is flawed for a number of reasons. EGAT’s commitment to Nam Theun 2 is not based on market or customer demand. The utility has a large surplus of generating capacity and its prediction that Thai consumers will need double the existing generating capacity by 2016 is highly speculative.<sup>42</sup> EGAT has overestimated demand growth every year from 1993 to 2003, which has resulted in over-investment in generating capacity and higher than necessary costs for the utility’s captive ratepayers.<sup>43</sup> By 2003, EGAT was reporting a surplus capacity of about 4,000 megawatts; over and above the 3,500 MW it defines as reserve generating capacity.<sup>44</sup> This means that about one-third of the country’s installed capacity is either idle or not in use much of the time. Given EGAT’s surplus and its record of over-investment, Thai consumers have good reason to be concerned that if Nam Theun 2 goes ahead, they could soon be paying for even more generating capacity they don’t need.

## 4 Nam Theun 2 is Part of EGAT’s High-Risk Monopoly Expansion

If the World Bank offers risk protection to Nam Theun 2 investors it would perpetuate the illusion that investing in a billion-dollar addition

to Thailand's power system, to meet some future demand, is a 'safe' investment. In reality, that safety only exists as long as the Thai government guarantees EGAT's power purchase payments, and as long as the utility has the legal authority to pass along its costs to Thai ratepayers. Without government protection, in other words, investors would not dare risk their capital on Nam Theun 2.

Investors know that Thailand's future electricity demand is highly uncertain despite EGAT's assurances. The slowdown in Thai demand growth since the mid-1990s has driven investors away from other planned hydro export projects in Lao PDR: "low gas prices, improvements in combined cycle gas plant efficiency, competition among IPP [Independent Power Producers] in Thailand, and excess capacity reserves have together resulted in a virtual hiatus in interest from new investors, and in the rate of development of Lao export IPP hydro power projects."<sup>45</sup>

A number of other factors are contributing to the uncertainty about future demand in Thailand. Almost 100 percent of the Thai population now has access to the Thai power system after several decades of rapid expansion; some of the country's largest industrial power consumers no longer rely on the central grid for their power needs. They have built on-site cogeneration plants to meet their own power and heating/cooling needs, which have reduced the need for more centrally planned expansion. As the economy and power consumption patterns

have diversified, and as smaller-scale generating technologies have become more economical and reliable, the utility planners' assumption – that all consumers need is more power from the central grid (regardless of the plant's location, its reliability or its operating flexibility) – is no longer valid.<sup>46</sup>

Insulated from risk, EGAT favours large-scale additions (i.e., 700 MW and up) to the central system as if it was still the 1970s, thus increasing the likelihood that demand won't materialize fast enough to allow for cost recovery without rate increases. About one-third of EGAT's planned new capacity between now and 2016 is to come from Nam Theun 2 and even larger-scale dams on the Salween River. At home, EGAT has announced plans for a string of gas-fired plants, each with an installed capacity of 700 MW.<sup>47</sup>

## **5 The Nam Theun 2 Deal Remains Secret; Not Subject to Competitive Bidding or Regulatory Oversight in Lao PDR or Thailand**

Without the benefit of open and competitive bidding, Thai power consumers have no way of knowing for certain whether the Nam Theun 2 deal is fair or competitive with alternative suppliers. There may be hidden liabilities and unfavourable terms in the power purchase agreement that could make the deal more costly to Thai power consumers than it appears now.<sup>48</sup> The former director of Thailand's National Energy Policy Office, Piyasvasti Amranand, made this point recently to the *Financial Times*.<sup>49</sup> Without

competition among generators and a proper regulatory framework to review investment decisions and protect consumers, Amranand warned, "there will be uncertainty for consumers, no incentives to improve efficiency, and . . . tariffs could actually go up."<sup>50</sup>

The World Bank's energy and mining sector board recommends that power purchase contracts should be reviewed by an arms length regulatory entity to ensure that project costs are fair and reasonable. Its 2004 operational guide for Bank staff advises client-governments to develop their role as strong regulators capable of protecting the rights of investors and upholding the rights of consumers in terms of quality standards and sustainable investments.<sup>51</sup> In the case of Nam Theun 2, however, the World Bank has clearly abandoned these principles.

The Bank has failed to insist upon full disclosure of project contracts as prerequisites for Bank funding.<sup>52</sup> The 1000-page concession agreement the Bank helped draft remains secret even though it "defines, incorporates and costs all the environmental and social obligations, including compensation principles and payments . . . that are to be strictly followed by the Project Company and the GoL."<sup>53</sup>

To insist that the Nam Theun 2 power purchase agreement and concession agreement be made public, Probe International and 39 other citizens groups wrote to the Bank last year. The response from Robert Mertz, the World Bank's

lead financial analyst for the East Asia & Pacific Region, was clear: the Bank's Disclosure Policy "prohibits us from disclosing documents which have been provided to the Bank on a confidential basis."<sup>54</sup>

Without disclosure, citizens are in the dark about the dam's operating costs and liabilities. Proponents tell the public what they think they ought to know and no more. For example, in 2002, the Nam Theun 2 Power Company's Technical Director, Peter Goldston, told a donors conference in Vientiane that his company would stop generating power during the flood season in order not to worsen flooding downstream along the Xe Bang Fai River.<sup>55</sup> He did not explain what financial penalty the company or the government would be obliged to pay EGAT when production was interrupted, possibly for weeks or months at a time. He did not explain where EGAT would get alternative power supply when Nam Theun 2 is shut down, and at what cost to which parties. He did not explain what financial and legal recourse residents downstream of Nam Theun 2 would have in the event the company failed to comply with the concession agreement, or downstream residents were unhappy with the terms of the concession agreement, or the government failed to enforce the concession agreement. Had a proper regulatory framework for hydro developers been put in place in Lao PDR, the dam's developers would have been obliged to explain the details and then win public consent for the proposed concession agreement long before it was finalized.

Instead, the World Bank has wrongly assumed that the public interest can be adequately represented and defended by the government of Lao PDR and its 25 percent ownership stake in the Nam Theun 2 Power Company. The Bank has ignored the government's conflict of interest, which is likely to make it an ineffective defender of local communities' interests whenever they conflict with the company's obligation to maximize profitability. The Bank points to its "safeguard policies" as proof that citizens' interests and rights would be protected in this case. In practice, however, the World Bank has no special authority or incentive to put citizens' rights before the interests of its client-government and the Nam Theun 2 Power Company.

In Thailand, EGAT's signing of the Nam Theun 2 deal without proper regulatory oversight or competitive bidding puts the public at risk. Thai consumers and taxpayers have no way of knowing or evaluating whether the deal is fair and reasonable. EGAT signed the dam deal before the Thai government approved a new electricity industry structure, which includes a regulatory body to oversee investment decisions and protect consumers. According to Thai energy minister, Prommin Lertsuridej, the industry framework approved last December will require investments in new capacity to be based on competitive bidding and subject to regulatory oversight.<sup>56</sup> Had this new framework become effective before EGAT signed the Nam Theun 2 deal, the Nam Theun 2 Power

Company would have been forced to disclose its plans to Thai regulators and compete against other suppliers for access to customers.

Notably, a study funded by the Asian Development Bank acknowledged the Lao PDR government's conflict of interest, as both an investor and regulator of power companies. In their 2001 review of the Lao PDR power sector, Electrowatt of Switzerland, pointed out the inadequacy of the country's electricity law, the government's "lack of decision making power with a minority interest; [and] the ephemeral nature of profits/dividends and the real risk of losses . . ."<sup>57</sup> Electrowatt further warned that having Electricité du Laos (EdL) as a permanent stakeholder in Independent Power Producer projects is unsuitable "due to the diversion of utility management capacity, distortion of the utilities' accounts, and the potential for conflict when decisions are made on domestic generation versus off takes from export IPPs."<sup>58</sup>

In order to "*obtain competitive construction prices and reduce project cost risk for both the GoL and lenders,*" writes Electrowatt, "*the GoL should legislate to require public tendering on all turnkey and IPP hydropower projects regardless of their source of funding. Furthermore, independent auditing of the non-construction project development costs claimed by IPP developers should also be required.*"<sup>59</sup>

## 6 World Bank Experts Are On Record Warning Against Uncompetitive Power Purchase Deals (Like Nam Theun 2)

The World Bank's leading power sector experts are on record warning client-governments that uncompetitive power purchase deals, such as Nam Theun 2, are unsound public policy from an economic and power consumer perspective.

In their 1994 report on Thailand's electricity privatization strategy, World Bank power sector experts, **Fiona Wolf** and **Bernard Tenenbaum** (among others), wrote: "*Many independent power producers will offer to build power plants at claimed 'good prices' and argue that competitive procurement is a waste of time. These offers will be tempting . . . [but] the danger of negotiated deals is that they often produce high prices and unfavourable contract terms. The single best way to obtain good price and non-price terms is by competitive procurement.*"<sup>60</sup>

They also advised the Thai government do the following:

- Make competitive procurement for new generation capacity mandatory; and
- Avoid plants larger than 300 MW: "*The larger the plant (more than 300 MW), the higher the financial requirements and the result in limited competition and very few bidders. Recent technological changes have substantially eliminated the traditional cost advantages of very large generating plants.*"<sup>61</sup>

Bank experts further advised that a new regulatory commission would need to "closely monitor EGAT's procurement of new generating capacity" because the prevailing "cost-of-service regulation" of electricity rates could strengthen the utility's bias toward building more plants of its own rather than allowing competition.<sup>62</sup>

Successive Thai administrations have opted to preserve EGAT's monopoly rather than allow competition and create a more customer-oriented system. Meanwhile report after report by the Bank's power sector experts warns that uncompetitive power purchase deals are not in the public interest:

**Jamil Saghir** and **Bernard Tenenbaum** of the Bank's energy and mining sector board, write that the "automatic pass-through" mechanism that allows utilities to pass along the costs of their uncompetitive power purchase contracts has promoted "inefficient and sloppy buying practices" on the part of utilities.<sup>63</sup>

**James Bond**, the Bank's director of energy, mining and telecommunications, reports that negotiated power deals in Southeast Asia have not led to improved sector performance or reduced costs to consumers.<sup>64</sup>

**Ranjit Lamech** and **Kazim Saeed** of the Bank's energy and mining sector board write that negotiated (i.e., power purchase deals arranged without competitive bidding) can lead to unsustainable costs.<sup>65</sup>

**Laszlo Lovei**, the Bank's energy

specialist for Europe and Central Asia, writes that the industry structure known as the "single buyer model" (EGAT's model) – whereby governments authorize independent power producers (IPPs) to generate electricity and sell it to the national power company – has major disadvantages: "it invites corruption . . . and imposes large contingent liabilities on the government."<sup>66</sup> First, "decisions about adding generation capacity are made by government officials who do not have to bear the financial consequences of their actions." This leads to an upward bias in the generation capacity procured. Second, power purchase agreements create a contingent liability for the government, which is expected to step in if the utility is unable to honor its obligation to the generator. "These implicit or explicit contingent liabilities can undermine the government's creditworthiness and, ultimately, macroeconomic stability." Third, "the single-buyer model responds poorly when electricity demand falls short of projections." Ideally, electricity prices would fall, stimulating demand, and revenue losses would be allocated to private financiers, best equipped to manage market risks. Under the single-buyer model, however, wholesale electricity prices rise because take-or-pay quotas (or fixed capacity charges) must be spread over a shrinking volume of electricity purchases. When these high prices cannot be passed on to final consumers, taxpayers must bear the losses.<sup>67</sup>

## 7 Nam Theun 2 Would Sink Electricité du Laos Further Into Debt

According to the latest available data, EdL was insolvent and uncreditworthy. Its annual debt payments (about \$100 million) equaled its domestic revenue. It had defaulted on some of its payments to the central government.<sup>68</sup> And many of its 30 hydro export deals with private hydro developers are not bankable or feasible and should be cancelled, according to Asian Development Bank consultants, Electrowatt.<sup>69</sup>

Electrowatt pinpoints many of the problems the World Bank's experts have warned against: "*The present unsolicited negotiated BOT [Build-Operate-Transfer] type of implementation*" has delivered only two projects in the last decade; "*lacks competition and transparency; has failed to filter out projects which do not meet [Government of Lao PDR] objectives . . . and is associated with a high degree of uncertainty and lack of program control by GoL.*"<sup>70</sup>

Electrowatt found that uncompetitive deals between EdL and international hydro developers have unfairly favoured the developers and led to high costs for EdL.<sup>71</sup> The utility is losing money on the South Korean-built Houay Ho dam. Project costs are difficult to verify and justify or evaluate. For example, the construction budget for the ADB-funded Nam Mang dam jumped from \$45 million to \$63 million during construction, while the project's installed generating capacity was inexplicably reduced from 51 MW to 35 MW.<sup>72</sup> As for

EdL's second public-private partnership, the Nordic-backed Theun-Hinboun dam, the ADB and the Nordic Development Fund have written off about one-quarter of the dam's investment cost, in an effort to improve EdL's deteriorating financial performance.<sup>73</sup>

The World Bank has advised the government of Lao PDR it wants to see improvement in Electricité du Laos' financial performance before it would be willing to finance Nam Theun 2.<sup>74</sup> But EdL's fundamental predicament remains: its capital investment program is unsustainable and the central government's diversion of EdL's revenue for purposes other than electricity service is crippling sustainable development of the country's power sector. Even with rate increases and the promise of Nam Theun 2 revenue starting in 2010, Electrowatt concluded: "EdL's capital expenditure program is too ambitious for the cash flow that EdL can generate."<sup>75</sup> EdL does "*not have the earning power to sustain the intensive capital investment program it proposes, service its large debt (even under restructured terms), and fund the losses in the exchange rate on US\$ denominated loans.*"<sup>76</sup>

## 8 Rural Communities in Lao PDR Would Be Better Served By Investments in Cheaper Off-Grid Technologies

Two million people in Lao PDR have no access to electricity service. Energy experts such as Michael Brown, Director of the World Alliance for Decentralized Energy, argue that investments in off-grid

generating technologies are a cheaper and faster way of delivering service to rural areas than large-scale power projects and long distance transmission lines.<sup>77</sup>

If Nam Theun 2 goes ahead, EdL plans to buy 95 MW of power from the Nam Theun 2 Power Company and then sell it back to its domestic customers already hooked up to the grid. The World Bank has endorsed this strategy but the Asian Development Bank's power sector study (posted on the Lao PDR government's Web site) reports that it would be cheaper for EdL to invest in smaller-scale projects than power off-takes from large export schemes.<sup>78</sup> The study also reports that importing power from Thailand would be cheaper than investing in large hydro dams (i.e., larger than 100 MW) to meet domestic needs.<sup>79</sup>

Officially, the GoL recognizes that rural households that do not have access to the grid would be "best served by off-grid electricity supply."<sup>80</sup> By 2010, the Ministry of Industry and Handicrafts aims to provide 270,000 households with off-grid service at a cost of US\$500 per household or US\$12 million a year. To this end, the World Bank and its Global Environment Facility arm have funded several off-grid pilot projects in southern Lao PDR. The GEF Web site states that: "Regional and international experience has demonstrated that diesel- and microhydro-powered as well as solar-powered battery charging stations should be part of a least-cost rural electrification strategy [in Lao PDR]."<sup>81</sup>

The problem is that the central government's decade-long focus on developing large-scale hydro export projects has left the utility mired in debt, and unable to attract the private capital or donor funding it needs to deliver rural electricity service. Investment in off-grid technologies suitable to sparsely populated rural areas is stalled. Solar and diesel hybrid projects, for example, have been planned in detail by the government's renewable energy office but remain starved of funding for implementation.<sup>82</sup>

The World Bank has funded renewable energy action plans in Cambodia and Vietnam but not Lao PDR. The bulk of its \$34.7 million rural electrification loan in Lao PDR, which officially was supposed to provide electricity service to 50,000 new customers using grid extension and off-grid community-based technologies, went to long distance transmission lines designed to handle electricity from future large-scale hydro export projects. Only \$2.2 million was allocated for off-grid power projects.<sup>83</sup>

In effect, the government's fixation on Nam Theun 2 and other hydro export deals has meant a decade of lost opportunity and investment in rural Lao PDR. If Nam Theun 2 were cancelled, the GoL could (arguably) concentrate on faster and cheaper extension of service to those who need it most. It could devote its limited but highly valuable expertise to ensuring high-quality low-cost investment in smaller scale projects that could be financed more easily, installed more quickly,

and better matched to local needs (i.e., in terms of cost, scale, operation and maintenance, fuel type, and reliability requirements).

## **9 Nam Theun 2's Output is More Costly and Less Economically Valuable Than Gas-Fired Combined Cycle Plants and Decentralized Supply Options in Terms of Reliability, Operating Flexibility, and Security of Supply**

The World Bank's promotion of Nam Theun 2 as a "vehicle for poverty alleviation" has successfully distracted the Thai and international media from evaluating the merits of Nam Theun 2 for what it is: a billion-dollar expansion of Thailand's power system. By focusing on poverty (and equating hydro revenue with poverty alleviation) rather than power consumers, the dam's developers have pandered to the World Bank while obscuring the truth about Nam Theun 2: the original 1970s-era economic justification for building it no longer exists. As power projects go, it can be argued that Nam Theun 2 is obsolete.

Nam Theun 2 proponents, including the World Bank, know that large hydro dams cannot compete with gas-fired combined cycle plants in terms of capital cost or the economic value of the dam's output in terms of reliability or operating flexibility or security of supply. A 1997 study of Nam Theun 2 alternatives (prepared for the Lao PDR government by hydro consultants Lahmeyer of Germany and Worley

of New Zealand) identified gas-fired combined cycle plants as "the most economically attractive types of candidate power plants for expansion of the Thai electricity supply system."<sup>84</sup>

Recognizing this trend, the dam-building industry journal, *International Water Power & Dam Construction*, published an article entitled, "The gas-fired threat to Southeast Asian hydro power," in 1998. The journal reported that independent power producers prefer gas-fired combined cycle plants to large hydro dams because of "environmental concerns and security of supply." Gas-fired combined cycle plants are better suited to meeting domestic power demands, it said. "[Gas] is easy to transport and domestic power generation produces the greatest value for the consuming country [Thailand]."<sup>85</sup>

The World Commission on Dams, sponsored by the World Bank and hydro industry leaders, said much the same thing in its 2000 report: "*In the face of competition and rapid market change, power utilities and producers favour low-risk options with short construction times, and preferably off-the-shelf technologies. Gas-fired combined cycle systems, which combine high efficiency and flexibility with a comparatively low initial investment cost, have become the preferred choice where gas is available.*"<sup>86</sup>

A key advantage to investors and utilities is that a pre-engineered combined cycle plant (the industry refers to them as 'gensets') can be installed and generating revenue in under 12 months thereby cutting interest costs on construction loans.

Nam Theun 2, on the other hand, is expected to take five years to build, assuming no geotechnical surprises at the dam site or other delays.

In the decade Nam Theun 2 was stalled without a market or investors, the World Bank, the Asian Development Bank, and two of the Nam Theun 2 Power Company's shareholders have invested in gas-fired combined cycle plants elsewhere.

For less than half the unit cost of Nam Theun 2, Electricité de France (EdF) is building a 715-MW gas-fired combined cycle plant in Vietnam. The World Bank and the Asian Development Bank have provided \$150 million in political risk insurance.<sup>87</sup> When the \$480 million Phu My 2.2 plant is completed later this year, EdF plans to sell its output to state-owned Electricity of Vietnam Corporation for 4.1 US cents per kilowatt-hour (which is slightly less than what EGAT has agreed to pay for Nam Theun 2 power). Note that a typical 700-MW combined cycle plant is valued at around \$350 to \$400 million, considerably less than the cost of the EdF plant. For \$412 million, a British-led consortium is building a 717-MW gas-fired combined cycle plant, the third in a series at the Phu My complex near Ho Chi Minh City. The Asian Development Bank put up \$40 million for Phu My 3, while the Bank of Japan and other international investors provided most of the capital.<sup>88</sup>

In Thailand, EGAT's private subsidiary, EGCO, operates eight combined cycle plants for an installed

capacity of about 2,400 MW. Two of its smaller plants (i.e., capacity under 200 MW) are co-owned by another Thai company, Amata, and two of Germany's largest private power producers, E.ON kraftwerke GmbH and Energie Baden-Wuerttemberg AG. The plants deliver power and steam to some of Thailand's largest industrial power consumers, including automobile, electronics, and computer manufacturers.<sup>89</sup>

Compared to Nam Theun 2, gas-fired combined cycle plants are the better investment for Thailand.<sup>90</sup> The combined cycle plant (in which a gas-fired turbine generates electricity and drives a second electricity-producing steam turbine either for industrial cogeneration or power production alone) can provide consumers with low-cost high-value power (and heat or cooling) for less capital cost than Nam Theun 2 and with far fewer emissions than a conventional coal-fired plant.

#### *Less Capital Cost*

A combined cycle plant costs about one-third to one-half the capital cost of Nam Theun 2. Depending on model and plant configuration, capital costs for combined cycle plants range between \$300 and \$750 per kilowatt (kW) compared to an estimated \$1000 per kW for Nam Theun 2.<sup>91</sup> Even the smaller units, known as "gensets" are very competitively priced: the 4 to 6 MW and 6 to 12 MW models cost under \$400 per kilowatt.<sup>92</sup>

If the Nam Theun 2 project were

cancelled and its budget invested in combined cycle plants, Probe estimates that Thailand could build at least 10 new high-efficiency 200-MW combined cycle plants to supply as and where new supply is needed – without the extraordinary cost of large-scale flooding and resettlement in Lao PDR.

#### *Greater Reliability*

Combined cycle plants offer consumers far greater reliability (thus higher value power) than Nam Theun 2.<sup>93</sup> Nam Theun 2's output is dependent on rainfall and could be crippled by drought. Every dry season, power production at Laos' largest and oldest hydro station, Nam Ngum, drops by half.<sup>94</sup> Similarly in Vietnam, where hydro dams generate half the country's power supply, consumers suffer blackouts and power shortages during the dry season months (April to June) when reservoir levels are at their lowest.<sup>95</sup> Nam Theun 2 would face the same problem every dry season. Its output could also be constrained by the company's obligations to minimize downstream environmental damage. According to Paul Cargill, one of the government's legal advisors, the Nam Theun 2 concession agreement obliges the company to make minimum downstream releases in the dry season "notwithstanding that it may thereby deprive EGAT of electricity and NTPC of revenue." And in the flood season: "if the Xe Bang Fai [river] is likely to flood as a result of the operation of the power house or is in flood, then that operation must cease regardless of EGAT's needs for power at the

time.”<sup>96</sup> In other words, power supply from Nam Theun 2 may be frequently interrupted or cutoff for months at a time if the Nam Theun 2 Power Company complies with the terms of the concession agreement.

Combined cycle plants have no such competing demands on their performance. The companies supplying combined cycle plants, Turbomach of Switzerland for example, offer guaranteed availability and reliability in long-term service agreements with the plant owners.<sup>97</sup> Most plants are available for full capacity service more than 90 percent of the year, including outages for service whereas large dams may only run at full capacity for a few months of the year.

#### *More Operating Flexibility*

Unlike Nam Theun 2’s output, which would be highly seasonal and subject to frequent interruptions, combined cycle plants are designed to respond to the varying demands of their customers. They can be sited close to consumers and are well suited to operating for peak or intermittent demand because they can be quickly switched on and off as needed. The plant operator has the choice of running both turbines for greater electricity output or running just the gas turbine to produce electricity while utilizing the waste heat for other purposes.

#### *Nam Theun 2 Would Increase Vulnerability to System Failure*

Like any large-scale and remote power station, Nam Theun 2

output would be vulnerable to disruption caused by grid failure (i.e., power lines over-heating, shorting or being downed by floods, lightning strikes, or landslides). If the grid connection between Nam Theun 2 and the Thai grid were to fail, EGAT would suddenly lose a huge block of power, which could then trigger other grid failures across the country.<sup>98</sup> Nordic hydro consultants, Norconsult, have pointed to this vulnerability in the case of EGAT’s proposed 3600-MW Tasang dam on the Salween River.<sup>99</sup> Norconsult recommended building two grid connections instead of one even though this would drive costs up without necessarily reducing the system’s vulnerability to failure.

#### *Fuel Versatility*

In areas where natural gas is not available, combined cycle plants can run on other fuels (i.e., low-sulphur diesel, oil distillate, or propane) and then be switched over to natural gas – which is the most economical and cleanest-burning fuel – when it becomes available. Where the extension of a gas pipeline is impractical or cannot be economically justified, electricity needs in remote areas can be met with small-scale combined cycle plants, using renewable fuels. Instead of natural gas, combined cycle plants can be fuelled with biogas derived from agricultural and forestry waste, which is often readily available in rural areas, or from landfill and waste treatment facilities in urban areas.

#### *Reduced Transmission Costs*

Combined cycle plants can be installed near industry or other demand centres, thereby reducing the need for transmission of electricity over long distances, lowering the overall cost of electricity to consumers, and eliminating the rationale for building environmentally destructive power projects in sparsely populated areas to serve distant markets. Instead of moving energy through electric wires, it is more energy-efficient to move gas through pipelines and avoid the losses experienced in electricity transmission systems, which can range anywhere from 30 percent to 70 percent. And because natural gas is methane, it is relatively easy to process compared with oil and less expensive to transport via pipeline than coal by rail.

#### *Reduced Emissions*

Combined cycle plants use less fuel per kWh and produce fewer emissions than conventional thermal plants, thereby reducing the environmental damage caused by electricity production. Compared with a coal-fired plant installed with the latest clean coal technology, the burning of natural gas in combined cycle plants is much cleaner. Combined cycle plants produce no sulphur and virtually no particulate matter; they reduce nitrous oxide emissions by up to 90 percent and carbon dioxide by 60 percent.

#### *Enormous Potential*

The region’s largest immediate potential for combined cycle

plants is in retrofitting old and polluting power plants, and building new plants next to industry that requires large amounts of electricity and heat or steam. In the paper industry, for example, 8 out of 14 processes require steam.

Pharmaceutical and textile industries also have a steady demand for steam. Sugar and rice mills are good candidates for cogeneration. The chemical fertilizer industry also has a large potential, and in rural areas, where forest and agricultural waste is readily available as a low-cost source of fuel, cogeneration potential warrants further investigation. A 32-MW plant, for example, can provide enough power and steam for a typical pharmaceutical or fertilizer manufacturing facility. A 14-MW plant would be suitable for a paper mill.

US utility experts, Carl Pechman and Miles Bidwell, warn that EGAT's failure to promote more domestic investment in industrial cogeneration could have "long-term negative ramifications on the competitiveness of [Thailand's industrial] sector." In their submission to Thailand's National Social and Economic Advisory Council last year, they also criticized EGAT's monopoly buyer status, saying that Thai industrial consumers would benefit more from "service options presented by multiple providers, and the ability to self-generate."<sup>100</sup>

## 10 Thai Power Consumers and Citizens Groups Want Utility Reform

Thailand has plenty of sensible alternatives to hydro imports from Lao PDR. The problem is that

existing rules and institutions in Thailand favour hydro imports from neighbouring countries where the social and environmental problems created by large dams can be easily externalized.<sup>101</sup>

Recognizing this, Thai consumers and citizens groups have called for a democratic restructuring of the power industry. They don't want citizens in neighbouring countries to be victimized and at home they want more decentralized choice and accountability from power producers.<sup>102</sup>

Successive rate increases have also fuelled dissatisfaction with EGAT. Consumer and environmental groups have objected to paying for EGAT's uncompetitive take-or-pay contracts with coal- and gas-fired IPPs (Independent Power Producers) at home, and its revenue shortfalls due to inaccurate demand forecasts.<sup>103</sup>

Large industrial power consumers are unhappy with EGAT's plan to privatize without restructuring for competition. They want the right to buy power in bulk direct from private generators. But EGAT is blocking access to the grid and restricting the number of licenses available for new generators, thereby stifling new investment and competition. According to Chen Namchaisiri, an analyst with the Federation of Thai Industries, "We look at [EGAT's] model of privatization and we see that we still haven't any choice."<sup>104</sup>

Last year, EGAT faced an unprecedented challenge from Thailand's

National Economic and Social Advisory Council – which includes representatives from the Thai Consumer Foundation, the Thailand Development Research Institute, the Law Society of Thailand, and the Appropriate Technology Association. The Council called for an end to EGAT's unchecked monopoly and new rules to promote decentralized and environment-friendly investment. As council member, Witoon Permpongsacharoen, explained to the Bangkok press: "There are plenty of small factories and local communities which have the potential to produce power from agricultural waste. We should look seriously at more sustainable options."<sup>105</sup>

The Council recommended separation of the state owned transmission system from EGAT's generating business so that new producers can have non-discriminatory access to the grid. As Charnchai Limpiyakom, vice-president of the Appropriate Technology Association of Thailand, explained, this would solve the problem of "EGAT controlling the highway and the transportation company at the same time which makes it difficult for any new company to compete."<sup>106</sup> The Council also recommended that a new regulatory body be set up to license new market participants and protect consumers from monopoly abuse, such as over-investment and self-dealing between EGAT and its subsidiaries.<sup>107</sup>

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- <sup>1</sup> All dollars are U.S. dollars unless otherwise noted.
- <sup>2</sup> Peter Stephens, World Bank regional communications manager, East Asia and Pacific Region (2004) Letter to the Editor, *The Nation*, February 13; World Bank (2004) “World Bank Executive Directors Conclude a 4-Day Visit to Lao PDR,” February 10. <http://www.worldbank.org>
- <sup>3</sup> *The Nation* (2004) “Laos Energy Project: World Bank to back dam,” February 12.
- <sup>4</sup> *International Water Power & Dam Construction* (2003) “PPA signed for Nam Theun 2,” p. 3; *The Nation* (2004) “Laos Energy Project: World Bank to back dam,” February 12; *The Nation* (2003) “Nam Theun Dam: Laos urged to use bonds for funds,” September 20.
- <sup>5</sup> Nam Theun 2 Power Company (2004) “Nam Theun 2 Financing Launched,” March 1. <http://www.namtheun2.com> Gas Turbine World (2002) “On-site engineering support for ‘BOT’ 780-MW Phu My 3 combined cycle,” September-October. PB Power has offices in the UK and Europe, and is part of the New York-based Parsons Brinckerhoff Group. It is participating in Vietnam’s Phu My 3 project as the owner’s engineer.
- <sup>6</sup> Probe International (1997) “World Bank Approves Guarantee Mechanism to Protect Private Deals with Risky Third World Governments,” Press backgrounder, June 4.
- <sup>7</sup> Jayashankar Shivakumar (2002) World Bank Involvement: Past, Present & Future,” Report on Symposium ‘Nam Theun 2 – Window to the Future,’ Vientiane, July 3, p. 71.
- <sup>8</sup> Paul Cargill (2002) “Details on Protection of GoL’s Interests,” Report on Symposium “Nam Theun 2 – Window to the Future,” Vientiane, July 3, p. 82-108.
- <sup>9</sup> World Bank (2002) “Decision Framework for Processing the Proposed Nam Theun 2 Project,” Report on the Symposium “Nam Theun 2 – Window to the Future,” Government of Lao PDR. Vientiane, July 3, p. 110.
- <sup>10</sup> Agence France Presse (2003) “Thai utility signs electricity deal with Laos dam project,” November 8. The Nam Theun 2 Power Company’s web site lists the following export credit agencies as potential financiers: Coface of France, Export Development Corporation of Canada, EKN of Sweden, and GIEK of Norway. AFD, the French government’s development agency, the Nordic Investment Bank, the Thai Exim Bank, and the Asian Development Bank are also listed. <http://www.namtheun2.com>
- <sup>11</sup> Dow Jones News Service (2003) “Thai EGAT Ups Forecast for New Capacity to 2,146 MW,” <http://www.sg.biz.yahoo.com>
- <sup>12</sup> For more project details see the Nam Theun 2 Power Company’s Web site <http://www.namtheun2.com>
- <sup>13</sup> The estimate of 5,000 people living inside the National Biodiversity Conservation Area comes from Lee Talbot of the Nam Theun 2 panel of social and environmental experts in the Government of Lao PDR (2002) “Report on the Symposium ‘Nam Theun 2 – Window to the Future,’” Vientiane, July 3, p. 58.
- <sup>14</sup> Electrowatt (2001) Vol.1, p. 84. Also see Bruce Shoemaker, Ian Baird, and Monsiri Baird (2002) *The People and Their River: A survey of river-based livelihoods in the Xe Bang Fai River Basin in Central Lao PDR*; and Usher and Ryder (1996) “Vattenfall Abroad: Damming the Theun River,” in *Dams as Aid: A political anatomy of Nordic development thinking*” p. 77-104.
- <sup>15</sup> World Commission on Dams (2000) “The Report of the World Commission on Dams,” November, p. 93.
- <sup>16</sup> Ibid.
- <sup>17</sup> Ibid.

- 18 World Commission on Dams (2002) “The Report of the World Commission on Dams,” November, p. 92.
- 19 Government of Lao PDR (2002) “Report on the Symposium ‘Nam Theun 2 – Window to the Future,’” Vientiane, July 3, p. 112.
- 20 Louis Berger International (1997) “Economic Impact Study of Nam Theun 2 Dam Project,” June 7, p. 7.  
The report estimates that the potential social and environmental costs, including up to US\$50 million for opportunity costs of land, are in the range of US\$60 to 130 million. The report says that a mitigation budget of US\$60 to 75 million for resettlement, biodiversity, construction, health, and downstream impacts “should be nearly adequate, in financial terms, to address the cost of the impacts, either through mitigation, offsets, or compensation. . . . In a pessimistic scenario, additional expenditures of \$335-50 million would be required for mitigation efforts, reducing the profitability of the project.”
- 21 Jayashankar Shivakumar (2002) “Report on Symposium on ‘Nam Theun 2 – Window to the Future,’” Vientiane, July 3, p. 113.
- 22 Government of Lao PDR (2002) “Report on Symposium on Nam Theun 2 – Window to the Future,” Vientiane, July 3, p. 110.
- 23 Ibid.
- 24 World Bank (2003) “World Bank Managing Director Shengman Zhang Concludes 4-Day Official Visit to Lao PDR,” Vientiane, May 3.  
<http://www.worldbank.org/lao>
- 25 The GoL has agreed with the World Bank and the International Monetary Fund to put its revenues from the project into a Poverty Reduction and Growth Fund, to be used as directed by the World Bank. For more details, see Government of Lao PDR (2002) “Report on the Symposium ‘Nam Theun 2 – Window to the Future,’” Vientiane, July 3, p. 120.
- 26 Ibid., p. 120.
- 27 World Bank (1995) “Aide Memoire to the Committee on Planning and Cooperation from the World Bank Technical Mission for the Nam Theun 2 Hydroelectric Project,” November 9. The mission was led by J. Shivakumar, and included 14 staff members: Enrique Crousillat, Gloria Davis, Concepcion del Castillo, Mostafa El-Erian, Robert Goodland, Arnaud Guinard, Rachel McColgan-Mohammed, Kathryn McPhail, Glann Morgan, Linda Schneider, John Shilling, Jamil Sopher, Bill Smith, and Thomas Walton.  
The Bank also appointed “three internationally recognized and fully independent panels” to “scrutinize the development and implementation of the Project.” They are: the three-member Environmental and Social Panel of Experts (Thayer Scudder, Lee Talbot, and Tim Whitmore now deceased), the five-member International Advisory Group (Dick de Zeuw, David McDowell, Emil Salim, Kazuo Takahasi, and Meg Taylor ), and the Dam Safety Panel of Experts. See Annex 6.19 of the World Bank’s Report on the Symposium “Nam Theun 2 – Window to the Future.” At least another six consultants were involved in the Bank-commissioned studies that began in 1995.
- 28 Independent Advisory Group (2001) “Third report of the International Advisory Group on the World Bank’s handling of social and environmental issues in the proposed Nam Theun 2 hydropower project in Lao PDR,” April 6; Gráinne Ryder (1996) “Forced Resettlement in Lao PDR: The World Bank and the Nam Theun 2 Hydropower Project,” in *The Political Ecology of Hydropower Development in the Lao People’s Democratic Republic*, Major paper submitted for the completion of a Masters in Environmental Studies, York University, December 13.
- 29 Paul Cargill (2002) “Details on Protection of GoL’s Interests, Report on Symposium ‘Nam Theun 2 – Window to the Future,’” Annex 6.16, p. 87. Note that the Concession Agreement protects the government’s expert panels from liability: according to Cargill, the Nam Theun 2 Power Company has agreed not to sue any of these experts “even if their actions or recommendations prove negligent.”
- 30 Louis Berger International (1997) “Economic Impact Study of Nam Theun 2 Dam Project,” Volume 1 (draft), June 7, p. 10. Note that the price calculated by Louis Berger does not include the full cost of compensation for damages to fishing and farming livelihoods along the Xe Bang Fai River, which could amount to additional millions of dollars.
- 31 Jean Delvallet (2001) E-mail to Probe International from Jean Delvallet, Nam Theun 2 Electricity Consortium Project Director, Re: NTEC information disclosure, February 17.

- <sup>32</sup> World Bank (2004) <http://www.worldbank.org/laopdr> March 4. Note that the Asian Development Bank is also assessing Nam Theun 2's economic viability. The Bank approved a second grant for Nam Theun 2 project preparation in March 2004, which includes funding for project management and NGO consultations. For more information, see LAO37734-02: GMS Nam Theun 2 Hydropower Development Project – Phase II at <http://www.adb.org/Documents/Profiles/PPTA/37734022.ASP>
- <sup>33</sup> Analysis of EGAT's cost and tariff data prepared by the Bangkok-based environmental group, Terra. <http://www.terra-per.org>
- <sup>34</sup> EGAT (2004) "IPP tariffs," Power point presentation (in Thai), Bangkok, June. For more information about Thai IPPs, see EGAT (2004) "Seven Awarded IPPs for 1994 Solicitation Program," May. <http://www.egat.co.th>
- <sup>35</sup> Ibid.
- <sup>36</sup> Mekong Sources (2002) Power Generation, Transmission, and Distribution in Vietnam," Report prepared for Probe International, Ho Chi Minh City, Vietnam, p. 38.
- <sup>37</sup> Thai energy ministry (2003) "Energy Strategy for Competitiveness Workshop (chaired by Prime Minister Thaksin Shinawatra), August 28.
- <sup>38</sup> Ibid.
- <sup>39</sup> Ibid.
- <sup>40</sup> *Financial Times* (2004) "Public or private, EGAT still has monopoly on Thai power: Analysts express concern at future plans for Bangkok behemoth," April 7.
- <sup>41</sup> World Bank (2004) <http://www.worldbank.org/laopdr> March 4.
- <sup>42</sup> Peter duPont (2003) "Overview of Electricity Demand in Thailand," Workshop on the Changing Face of Electricity Markets in the Mekong River Basin, Phnom Penh, January 29-29.
- <sup>43</sup> See, for example, *The Nation* (2004) "Egat surplus adds to electricity bills," February 17.
- <sup>44</sup> ASEAN Power Grid Information Center (2003).
- <sup>45</sup> Electrowatt (2001) "Final Report: Power Sector Strategy Study," Asian Development Bank TA 3374-LAO, Volume 1, 91.
- <sup>46</sup> Witoon Permpongsacharoen (2003) Personal communication, Bangkok. Permpongsacharoen, vice-chair of the National Social and Economic Advisory Council's energy sub-committee, questions the power planners' assumption that what Thai power consumers need is an endless expansion of 'cheap' power supply. For more on how technological advances are changing utility planning in the US, see Lovins (2003) *Small is Profitable: The Hidden Economic Benefits of Making Electrical Resources the Right Size*.
- <sup>47</sup> Electricity Generating Authority of Thailand (2003) "List of Projects for PDP 2003," p. 8-17; *Bangkok Post* (2004) "Government plans to build four power units by 2010," January 26.
- <sup>48</sup> In June 2003, Thailand's Attorney General found that EGAT was disadvantaged by numerous clauses in the proposed purchase agreement. One clause, for example, required that EGAT purchase the project's assets if it stopped buying power from the dam in future. Another clause required EGAT to pay a fine at a higher rate than any of the other parties if it failed to take electricity from the project. This was reported in the *Bangkok Post* ("Attorney General questions Laotian deal," June 23, 2003) Sources in Bangkok report that EGAT dismissed the Attorney General's concerns and it is not clear which, if any, problem clauses were removed prior to the signing of the final power purchase agreement.
- <sup>49</sup> *Financial Times* (2004) "Public or private, EGAT still has monopoly on Thai power: Analysts express concern at future plans for Bangkok behemoth," April 7.

- 50 Ibid.
- 51 World Bank (2004) “Operational Guidance for World Bank Group Staff: Public and Private Sector Roles in the Supply of Electricity Services,” World Bank Energy and Mining Sector Board, February.
- 52 World Bank (2003) Letter from Robert Anton Mertz, Lead Financial Analyst, Energy and Mining Sector Unit, East Asia & Pacific Region, to Shannon Lawrence, Policy Analyst, Environmental Defense, USA, September 9.
- 53 Nam Theun 2 Power Company (2003) <http://www.namtheun2.com>
- 54 Letter from 40 NGOs from 21 Countries to World Bank President, June 24. <http://www.probeinternational.org>
- 55 Government of Lao PDR (2002) Report on Symposium, “Nam Theun 2 – Window to the Future,” Vientiane, July 3, p. 14.
- 56 *Business Day* (2003) “Cabinet hear new power plan next week,” December 3.
- 57 Electrowatt (2001) Final Report: Power Sector Strategy Study, Asian Development Bank TA 3374-LAO, Vol.1, p. 22.
- 58 Ibid., Vol.1, p. 22.
- 59 Electrowatt (2001) Final Report: Power Sector Strategy Study, Asian Development Bank TA 3374-LAO, Vol.1, p. 170.
- 60 Fernandez et al (1994) Increasing Private Sector Participation and Improving Efficiency in State Enterprises, World Bank, p. 70.
- 61 Ibid., p. 71-72.
- 62 Ibid., p. 69-74.
- 63 Beatriz Arizu, Luiz Maurer, Jamil Saghier, and Bernard Tenenbaum (2004) “Pass Through of Power Purchase Costs: Regulatory Challenges and International Practises,” World Bank Energy and Mining Sector Board, Discussion Paper No. 10, February.
- 64 James Bond (2003) “International Energy Policy.” <http://www.worldbank.org>
- 65 Ranjit Lamech and Kazim Saeed (2003) “What International Investors Look For When Investing in Developing Countries,” World Bank Energy and Mining Sector Board Discussion Paper No. 6, May.
- 66 Laszlo Lovei (2000) “The Single-Buyer Model,” *Public Policy for the Private Sector*, December.
- 67 Ibid.
- 68 Electrowatt (2001) Final Report: Power Sector Strategy Study, Asian Development Bank TA 3374-LAO, Vol.1, p. 123.
- 69 Ibid., p. 22.
- 70 Ibid., p. 95.
- 71 Ibid., p. 157.
- 72 Ibid., p. 157.

- 73 Ibid., p. 27.
- 74 Jayashankar Shivakumar (2002) “World Bank Involvement: Past, Present & Future,” Report on Symposium on ‘Nam Theun 2 – Window to the Future,’ Vientiane, July 3, p. 67.
- 75 Electrowatt (2001) Final Report: Power Sector Strategy Study, Asian Development Bank TA 3374-LAO, Vol.1, p. 28.
- 76 Ibid., p. 28.
- 77 Michael Brown (2003) <http://www.localpower.org>
- 78 Electrowatt (2001) Final Report: Power Sector Strategy Study, Asian Development Bank TA 3374-LAO, Vol.1, p. 95.
- 79 Ibid., p. 23.
- 80 <http://www.lao-energy.com> Power sector study section 1.18.5 off-grid rural electrification.
- 81 <http://www.gefweb.org>
- 82 <http://www.lao-energy.com>
- 83 Electrowatt (2001) Final Report: Power Sector Strategy Study, Asian Development Bank TA 3374-LAO, Vol.1, p. 42.
- 84 Lahmeyer International and Worley International (1998) “Nam Theun 2 Study of Alternatives,” World Bank, March.
- 85 *International Water Power & Dam Construction* (1998) “The gas-fired threat to SE Asian hydro power,” August, p. 14-15.
- 86 World Commission on Dams (2000) *Dams and Development: A New Framework for Decision-Making*, p. 153.
- 87 *Gas Turbine World* (2001) “EdF to develop 715-MW plant,” November-December; World Bank (2002) Vietnam Guarantee Project (PID10634).
- 88 *Asia Times* (2004) “Vietnam’s first BOT power plant opens,” March 3; *Gas Turbine World* (2002) “On-site engineering support for ‘BOT’ 780-MW Phu My 3 combined cycle, September-October; *Gas Turbine World* (2004) “Phu My 3 site rated 717 MW and 56.8% combined cycle efficiency,” April-May, p. 10-13.
- 89 Amata (2003) Amata Company Profile, p. 1-16 See also <http://www.egco.com>
- 90 By pointing out the advantages of combined cycle plants, Probe International is not advocating that the World Bank redirect funding from Nam Theun 2 to combined cycle plants or any other generating technology or projects. We believe the World Bank is an obstacle, not an enabler, of sustainable power system development in the Mekong region and as such should exit from the sector altogether. If the Bank must have a transitional role, it should be limited to ensuring its client-governments and utilities compensate all their victims and do what they have promised yet failed to do: phaseout state-protected monopolies in generation and introduce democratic regulation of the power industry.
- 91 *Private Power Executive Handbook* (1998); Also see Norconsult (2002) Regional Indicative Master Plan on Interconnection in the GMS, Asian Development Bank, p. 2-21. Norconsult reports that a 200-MW gas turbine in Vietnam costs \$365 per kW; a 430-MW combined cycle plant costs \$536 per kW; a 350-MW coal-fired plant costs \$952 per kW.
- 92 *Gas Turbine World* (2004) “Gas turbine power plant suppliers adapting to global project demand,” April-May, p. 14-15.
- 93 The economic and environmental advantages of gas-fired combined cycle plants also apply to many other renewable options. Microturbines

in the 30 to 150 kilowatt range, for example, can economically generate power using biogas from waste treatment facilities and food processing plants. For more information about microturbines see, for example, *Cogeneration & On-Site Power Production*. See also <http://www.localpower.org> and <http://www.energycentral.com>

94 Electrowatt (2001) Final Report: Power Sector Strategy Study, Asian Development Bank TA 3374-LAO.

95 Mekong Research (2002) "Power Generation, Transmission, and Distribution in Vietnam," Report prepared for Probe International, December 15, p. 27; *Asia Times* (2004) "Vietnam's first BOT power plant opens," March 4.

96 Paul Cargill (2002) "Details on Protection of GoL's Interests," Report on Symposium on 'Nam Theun 2 – Window to the Future,' Vientiane, July 3, p. 107.

97 *Gas Turbine World* (2003) Summer Issue.

98 For more details about how centralized power in North America has increased vulnerability to system failure, see Lovins (2002) *Small is Profitable: The Hidden Benefits of Making Electrical Resources the Right Size*, Rocky Mountain Institute.

99 Norconsult (2002) Regional Indicative Master Plan on Interconnection in the GMS, Asian Development Bank, Chapter 5, p. 5-38.

100 Carl Pechman and Miles Bidwell (2003) "Review of Boston Consulting Group Analysis of Power Sector Reform Alternatives," December. The full report is posted on Probe's Web site at <http://www.probeinternational.org>

101 Serious problems associated with earlier hydro export schemes remain unresolved and unaccounted for in project costs. In one case, resettlement costs were underestimated by \$7,000 per household. For more details see Electrowatt (2001), Final Report: Power Sector Strategy Study, Asian Development Bank TA 3374-LAO, Vol.1, p. 84.

102 *The Nation* (2004) "Third path urged over dispute," March 13. Decentralized energy is an industry term defined as "the high-efficiency production of electricity (and heating/cooling where possible) at or near the point of use, which includes high-efficiency cogeneration and on-site renewable energy systems and energy recycling technologies that capture otherwise wasted energy. See for example *Cogeneration & On-Site Power Production* (2003) "World Alliance for Decentralized Energy: September-October, p. 78-79; and Howard Geller, "Fostering a clean energy revolution," p. 26-31.

103 Apsara Palettu (2004) "Thailand's power sector reform: Privatisation or piratisation?" *Watershed*, p. 10-18. On the higher-than-necessary costs of EGAT's power purchase deals, the author reports that EGAT pays its two subsidiaries, EGCO and Ratchaburi Holding, 20 percent more for electricity than from other non-affiliated IPPs.

104 *Financial Times* (2004) April 7. Also see Apsara Palettu (2004) "Thailand's power sector reform: Privatisation or piratisation?" *Watershed*, p. 10-18.

105 *Nation* (2003) "Energy revamp urged," August 20. EGAT has restricted licenses for small power producers to a few select companies. For example, Finnish multinational, Jaakko Poyry, is building four 20-MW plants that will be fuelled with rice husk using equipment from Rolls Royce Power Ventures and funded by a Dubai-based renewable energy equity fund, and a Malaysian renewable energy development company. <http://www.ewe.ch>

106 *Nation* (2003) "Energy revamp urged," August 20.

107 *Ibid.* Also see *Watershed* (2004) "Mekong Electricity Trends;" and Chuenchom Sangarasri (1999) "Falling demand for electricity, rising demands for change: EGAT and its legacy in the era of privatization," p. 33-40.