Serbia: Emergency Aid Energy and Untied Financial Loan Energy

Ex-Post Evaluation Report

OECD sector	1) Material relief assistance and services/72010 2) Coal-fired power plants/23063	
BMZ project number	1) 2000 40 584 (Emergency Aid Energy) 2) 2001 42 430 (Untied Loan Energy)	
Project executing agency	Electric Power Industry of Serbia (EPS)	
Consultant	VEAG Powerconsult, Vetschau	
Year of ex-post evaluation	**2008**	
	Project appraisal (planned)	**Ex-post evaluation (actual)**
Start of implementation	1) 4th quarter 2000 2) 1st quarter 2002	1) 4th quarter 2000 2) 1st quarter 2002
Period of implementation	1) 12 months 2) 13 months	1) 12 months 2) 28 months
Investment costs	1) EUR 15.3 million 2) EUR 51.2 million	1) EUR 15.3 million 2) EUR 54.2 million
Counterpart contribution	1) ./. 2) EUR 0.1 million	1) ./. 2) EUR 3.1 million
Finance, of which FC funds	1) EUR 15.3 million 2) EUR 51.1 million	1) EUR 15.3 million 2) EUR 51.1 million
Other institutions/donors involved	None	None
Performance rating	1) and 2) 3	
• Relevance	1) and 2) 3	
• Effectiveness	1) and 2) 2	
• Efficiency	1) and 2) 3	
• Overarching developmental impact	1) and 2) 3	
• Sustainability	1) and 2) 3	

Brief Description, Overall Objective and Programme Objectives with Indicators

The emergency relief programme comprised electricity imports in the months of November and December 2000 as well as spare parts supplies, primarily for the Nikola Tesla Power Station and the upstream coalmines. The untied financial loan was concerned with refinancing old projects in the production and transmission sector, rehabilitating Block B2 in the Nikola Tesla B Power Station and repairing a bucket-wheel excavator in the Kolubara opencast lignite mine. The programme objective was to rapidly secure power supply in Serbia at the end of 2001 so as to help promote economic development and social stability and support the new pro-reform

government. In hindsight, the objectives hierarchy is defined as follows, applying for both programmes alike:

- Overall objective 1: Contribution to supporting the new pro-reform government
  Indicator:
  - Permanent departure from the previous political regime. Actual situation: Considering the current political climate, the objective has been accomplished with reservations.

- Overall objective 2: Contribution to macro-economically efficient power supply
  Indicators:
  - The ratio of productive electricity use in the integrated grid system amounts to at least 60% at final inspection. Actual situation: The ratio amounts to merely 40-50%, so the indicator target has not been met.
  - Macroeconomic cost recovery in the integrated grid system amounts to at least 65% at final inspection. Actual situation: The figure ought to be about 50%. At present therefore, the indicator target has not been met, but future developments are likely to move in the right direction.
  - Transmission and distribution losses in the integrated grid system do not exceed 20% at final inspection. Actual situation: Losses have declined to 14%, meeting the indicator target.

- Programme objective 1: Sustainable operation of power station
  Indicators:
  - Block B2 in the Nikola Tesla B Power Station records an availability ratio and workload performance of at least 75% respectively, beginning December 2002. Actual situation: Between 2003 and 2007 the availability ratio of Block B2 came to between 87% and 92% and workload performance ranged between 88% and 97%. Indicator target achievement is therefore very good.
  - The relevant immission thresholds are adhered to. Actual situation: Some relevant values are complied with, others are not. EPS is making great efforts to improve the situation. The indicator target has therefore been met in part.

- Programme objective 2: Sustainable operation of the excavator and reliable coal supplies to the Nikola Tesla Power Station
  Indicator:
  - Average workload performance of 60%, contributing to an efficient operation of the coal mine-power station system, beginning in December 2002. Actual situation: The excavator only started operation after a long delay in 2004. Workload performance was only attained as of the second operating year, with a continuous increase since from 49% in 2005 to 64% in 2007. The indicator target has therefore been largely met.

Altogether, the overall objectives can be rated as achieved in part and the programme objectives almost in full.

The programmes form part of FC assistance to the Serbian energy sector, which besides the financial and water sector belongs to the portfolio of German Development Cooperation with Serbia.

Programme Design/Major Deviations from Original Planning and Main Causes

The emergency relief programme comprised electricity imports in the months of November and December 2000 as well as spare parts supplies, primarily for the Nikola Tesla Power Station and upstream coalmines. The untied financial loan was concerned with refinancing old projects in the production and transmission sector, rehabilitating Block B2 in the Nikola Tesla B Power Station and repairing a bucket-wheel excavator in the Kolubara lignite opencast mine.

Altogether, the programme design of financing old projects combined with retrofitting obsolete plant with new and modern technology at critical points proved useful and appropriate. The anticipated result of improving power generating capacity in quantitative and qualitative terms was achieved. Power production in Block B2 was raised by 10-15% as a result of the rehabilitation measures. In addition, the excavator overhaul contributed to securing coal supply and with that the operational sustainability of the rehabilitated Block B2.

An open call to tender was carried out for the first time in the EPS to place the financed rehabilitation works in Kolubara. Although the excavator overhaul was heavily delayed due to mis-specifications on the part of EPS, the contract award set a general precedent for the organisation of other calls to tender in documentation, specification, design and the introduction of new technologies and can rate as a showcase example of know-how transfer.

The Nikola Tesla B is one of the major power stations in Serbia with a nominal capacity of 1,240 MW (2 blocks with 620 MW each), accounting for about 25% of Serbian power production. It is fuelled by coal, which is also mined in the Kolubara D coalfield. Almost all the coal mined there (approximately 26 million tonnes/year) is transported to the power station. There is therefore a direct connection between the two financed components of the second phase: the rehabilitation of the excavator in Kolubara D and the rehabilitation of block B2 in the Nikola Tesla Power Station.

The rehabilitated power station Block B2 was recommissioned in October 2002. Its availability ratio ranged between 87.0% and 92.2%, averaging 89% between 2003 and 2007, well exceeding the aggregate average for EPS power stations of 76.8%. Block output ranged between 544 MW and 591 MW, at an average of 560 MW in the same period. Workload performance varied between 90% and 97%, averaging a very good 92%. According to the management, the measures raised the efficiency of the block by about 2% to some 35%, contributing to a higher annual output of some 10-15%.

Due to rehabilitation delays, the excavator was not operational until December 2004. This meant that the planned operation deadline (December 2002) could not be met. The main reason for this was difficulties in the call to tender, due to mis-specifications of parts by EPS. After a short trial phase in coal extraction, the excavator has been

used for overburden removal since 2004 and can be transferred to coal extraction at short notice. It has exceeded the targets set by EPS every year since 2004, removing between 5.3 million m^3 and 7.8 million m^3 of mining debris a year between 2005 and 2007. The availability ratio of the excavator rose sharply to 64% in 2007 from 49% in 2005, with capacity utilization rising in the same period from 39% to 44%. Excavator efficiency has therefore increased continuously since commissioning, particularly due to the improved performance of upstream and downstream mining components. It is rated as the most important and most efficient excavator in opencast operations. At present, its lifespan is estimated at 25 years, in excess of the 15 years forecast at appraisal.

The maintenance and servicing of the financed plant in Nikola Tesla B is adequately assured. It has been in sound condition till now and there have been no technical problems so far. A critical point, however, is that the individual power station units that are to operate as independent subsidiaries (here: TPPs Nikola Tesla plc) after the reorganisation of EPS still depend on financial appropriations from EPS for servicing and maintenance (and other investments). This dependence poses a certain risk for a sustainable servicing and maintenance scheme.

Key Results of Impact Analysis and Performance Rating

The main impacts of the programmes consisted in their contribution to stabilising the political/social climate and power supply in Serbia, the latter largely benefiting private users but also industry and trade. It is not possible to quantify the income and employment effects of the programmes, however. They contribute to general poverty reduction at macro and sectoral level; as at programme appraisal, we allot them the marker MSA. Besides their short-term effects, the programmes also make up part of general progress in the sector. This is not, however, directly attributable.

The programmes did not aim at gender equality and no gender impacts (marker G 0, as at programme appraisal) are attributable to them. As at appraisal, the programmes were not aligned with participatory development and good governance, either (PD/GG 0). In hindsight, though, we allot them the marker PD/GG 1, as the developmental rationale did include democratisation, pluralism, rule of law/human rights and good sectoral governance.

Only a very rough environmental impact assessment was made of the untied financial loan programme, which was accorded the marker UR 0 at appraisal. The environmental aspects of the power station and the coalmine were examined thoroughly at the ex post evaluation. The power station keeps to some emission and immission thresholds, but exceeds others. More efficient use is made of coal calorific value in the overhauled power station block, resulting in environmental benefits. The programmes were not geared to environmental protection and resource conservation, thus confirming the UR 0 marker in the programme appraisal report.

Notwithstanding their quite different design, the two programmes will be evaluated for developmental efficacy together, also because a separate assessment of the

emergency relief programme would be quite impracticable. We assess them as follows:

- Relevance: Both programmes were designed to support the new pro-reform government. At programme appraisal in 2000/01, Serbia was in a difficult process of political change. Regular and protracted load sheddings in the power sector seriously affected the conditions of life. Both programmes contributed to remedying this core problem. At programme appraisal, the Serbian government had a clear and understandable interest in stabilising the power sector. In today's still fragile political climate, it is still aware of the large economic and political importance of the sector and is continuing with its effective development on the whole, also supported by other donors. The various donors generally pursue the same reform goals in the power sector, without, however, any formal coordination. Nor are the reform outcomes so far satisfactory. The results chains at programme appraisal, envisaging stabilising the sector through electrical power supply and investments as a prerequisite for sustained economic growth, are still valid. We assess the relevance of the programmes as sufficient (Subrating 3).

- Effectiveness: As indicated above, the objectives applied today - sustainable operation of the power station and excavator and reliable coal supplies to the power station - have largely been met. We therefore classify effectiveness as good (Subrating 2).

- Efficiency: The programmes proved to be appropriate in microeconomic terms, since the rehabilitation of the plant was indispensable for the future operation of the power station and the opencast mine, the efficiency of the power station was increased (savings in production costs and reductions in harmful emissions) and new investments would have been far more costly than rehabilitation. They were also warranted from a macroeconomic standpoint, since electricity generation using a local source of energy ought to be more economical than the alternative of importing electric power. The programme facilities are also put to adequate use. The operational efficiency of EPS has improved considerably, although the electricity tariffs still do not cover costs in full. Altogether, we rate efficiency as sufficient (Subrating 3).

- Overarching developmental impact: The anticipated overarching developmental impact as defined by today's *state of the art* has been achieved in part. A contribution was actually made to supporting the young pro-reform government, but the current domestic situation is still precarious. In terms of the general direction, a contribution has also been made to efficient macroeconomic power supply, but considering the still insufficient macro-cost recovery rate and the relatively high fraction of consumer electricity, this cannot be confirmed in full. Altogether, we classify the impact as sufficient (Subrating 3).

- Sustainability: Together, electricity imports, spare parts procurements and refinance for old projects together make up 59% of the programme package's total costs. These programme components have had very limited capacity-building effects, but these were not aimed at in any case. The supplies,

however, contributed to keeping the sector operational in the short term, thus laying a sound foundation for subsequent investments. In view of the good operation and the higher efficiency of EPS, the rehabilitation of the power station and excavator (41% of total costs) can rate as sustainable. Despite some reservations regarding the partial failure to meet the operational appraisal criteria (cost recovery rate), we judge sustainability to be sufficient (Subrating 3).

After weighing up the individual subratings, we assess the performance of the programmes as a whole as sufficient. The benefits outweigh the deficits (Rating 3).

General Conclusions

The measures in both programmes were well conceived, also in hindsight. No major deficits are evident in implementation, either. There are, however, shortcomings as to future requirements in the Serbian power sector. The criterion of allocative efficiency has still not been met, nor have the operational appraisal criteria in major points (macroeconomic cost recovery rate, use of electricity). In retrospect, a contribution could have already been made to this at the time by linking the programmes (at least the untied financial loan, which had a longer timeframe) with a wide-ranging, medium-term reform programme and maintaining ongoing sectoral dialogue with the Serbian partners, primarily with the EPS and the energy ministry, also involving all donors engaged in the sector. At the same time, energy is not a priority of German development cooperation in Serbia and as a rule sectoral dialogues have proved difficult to conduct in Eastern Europe. Setting conditionalities would also certainly have been unsuitable, as related sanctions would not have been enforceable in practice (although some conditionalities have been defined for raising tariffs in follow-on projects). The key points should at least have been conveyed to the partners in writing so as to document a joint development-policy rationale and already pave the way for a critical sectoral dialogue by means of these two programmes. In similar cases, we therefore recommend clarifying with the partners from the outset the need for structural reforms as the only way to remedy basic sectoral problems, regardless of the urgency of the measures.

Notes on the methods used to evaluate project success (project rating)

Projects are evaluated on a six-point scale, the criteria being relevance, effectiveness (outcome), "overarching developmental impact" and efficiency. The ratings are also used to arrive at a final assessment of a project's overall developmental efficacy. The scale is as follows:

1 Very good rating that clearly exceeds expectations

2 Good rating fully in line with expectations and without any significant shortcomings

3 Satisfactory rating – project falls short of expectations but the positive results dominate

4 Unsatisfactory rating – significantly below expectations, with negative results dominating despite discernible positive results

5 Clearly inadequate rating – despite some positive partial results the negative results clearly dominate

6 The project has no positive results or the situation has actually deteriorated

A rating of 1 to 3 is a positive assessment and indicates a successful project while a rating of 4 to 6 is a negative assessment and indicates a project which has no sufficiently positive results.

Sustainability is evaluated according to the following four-point scale:

Sustainability level 1 (very good sustainability)

The developmental efficacy of the project (positive to date) is very likely to continue undiminished or even increase.

Sustainability level 2 (good sustainability)

The developmental efficacy of the project (positive to date) is very likely to decline only minimally but remain positive overall. (This is what can normally be expected.)

Sustainability level 3 (satisfactory sustainability)

The developmental efficacy of the project (positive to date) is very likely to decline significantly but remain positive overall. This rating is also assigned if the sustainability of a project is considered inadequate up to the time of the ex post evaluation but is very likely to evolve positively so that the project will ultimately achieve positive developmental efficacy.

Sustainability level 4 (inadequate sustainability)

The developmental efficacy of the project is inadequate up to the time of the ex post evaluation and an improvement is very unlikely. This rating is also assigned if the sustainability that has been positively evaluated to date is very likely to deteriorate severely and no longer meet the level 3 criteria.

The overall rating on the six-point scale is compiled from a weighting of all five individual criteria as appropriate to the project in question. A rating of 1 to 3 indicates a “successful” project while a rating of 4 to 6 indicates an “unsuccessful” project. In using (with a project-specific weighting) the five key factors to form a overall rating, it should be noted that a project can generally only be considered developmentally “successful” if the achievement of the project objective (“effectiveness”), the impact on the overall objective (“overarching developmental impact”) and the sustainability are considered at least “satisfactory” (rating 3).