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UNFCCC Secretariat
Martin-Luther-King-Strasse 8
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Att: JI Supervisory Committee

Date: 16.11.2007

Response to request for review
Rehabilitation of Dolna Arda Hydropower Cascade, Bulgaria (0040)

Dear Members of the JI Supervisory Committee,

We refer to the requests for review raised by three JISC members concerning DNV's determination of the project activity entitled "Rehabilitation of Dolna Arda Hydropower Cascade, Bulgaria" (0040). Project participant NEK and Pöyry have commonly prepared the following initial response to the issues raised by these requests for review. Pöyry has been authorised by NEK to communicate with the JISC (see Annex 1).

Issue 1
Financial additionality
(1) Additionality, the PDD only contains qualitative assessment of he financial barriers the project face, however no supporting documents are provided. The PDD further states that the additionality of the project activity is demonstrated through a qualitative assessment of investment barriers and a quantitative financial analysis which shows that the expected ERU revenues improve the financial viability of the project, however, no quantitative information has been provided.
(2) According to the documents contained in the PDD and annexes about the project's additionality, this is based on financial barriers. Particularly restrictions to access to the financial resources to finance the project under reasonable conditions of rates, amount, periods. This is a very reasonable argument to prove additionality, but there is no financial analysis or documentation that could give certainty on the arguments described on the PDD. The Determination report did not address the additionality issue and does not provide any additional information or interviews with the purpose to solve this critical aspect, and arrive at the final conclusion given the limited amount of information provided in the PDD. All the mentioned above is a critical for the JI projects, for that reasons it is necessary to request a review in order to ensure compliance with one of the main requirement to qualify as a JI project under track 2.
(3) There is no evidence of the financial additionality

Project participant's response:
In the JISC document "Guidance on criteria for baseline setting and monitoring", several options for the demonstration of the project additionality are given in "Annex 1 Additionality". The project developer has used the option mentioned under 2.b.iv that the additionality is shown by giving transparent information in line with a comparable project

(same GHG mitigation measure, same country, similar technology, similar scale) that an accredited independent entity has already positively determined.

The Dolna Arda Rehabilitation project is a follow-up project of the Vacha Cascade JI project which was successfully determined by DNV in November 2003 and received a Letter of Approval by Bulgaria. Dolna Arda and the Vacha Cascade project have the following characteristics:

- medium size hydro power plants in Bulgaria owned by the same company (NEK)
- package of rehabilitation of existing units and the construction of new units

In the Determination Report for Dolna Arda, DNV has come to the conclusion that the data given in the documents and in the CL 2 by the project participants sufficiently justified the investment costs and the results of the NPV analysis.

In order to respond to the requests for review, the project participants deliver in Annex 2 the Cash flow spreadsheets for the financial calculation of the project. The results of these calculations are shown in the following table:

	With ERU	**Without ERU**
Internal Rate of Return (IRR)	**6.7%**	**6.5%**
Net Present Value (NPV)	**13 million**	**11.58 million**

The ERU revenues increase the IRR and the NPV of the project. Additionally, the ERU revenues in “hard” EUR currency improve the economic project feasibility. The Project IRR is considered too low if you take into account the problems and restrictions to access to the financial resources (see PDD pages 12/13). The status of a JI project was one of the key criteria in order to get acceptable financial conditions with different banks. The conclusion of an Emission Reduction Purchase Agreement (ERPA) is a precondition for the financing contract to come into force, and therefore a definite requirement for undertaking the project. Therefore, the project can be considered additional.

Issue 2
Influence of new unit
- The installation of a new unit may affect the power generation of other existing units and this influence should be well reflected in both the baseline and the monitoring plan.
- It is clear from the document how a new unit can increase installed power, however it is not clear how it can increase the overall electricity production from the same water balance
- The Monitoring Plan is not taking into account the affect of unit 5 on units 1-4 electricity production considering that the water supply is the same

Project participant’s response:
The hydrological analysis for Studen Kladenets HPP is made by simulating the operation of the power plant with four and five (the new additional capacity) hydropower units in operation over the period 1980-2004 and maintained water balance for the Studen Kladenets reservoir. Complying with the condition so defined, the effect of the increased energy output is due to two major factors:

- additional energy generation resulting from the increased aggregate capacity (flexibility) of the plant machines that enables operation in case of a higher water level of the dam reservoir cup;

- additional energy generation by unit number 5 when it operates in the event of high water overflow.

As to the first of the two mentioned factors, for each month of the considered 25-year period, the water levels of Studen Kladenets reservoir are determined in accordance with the projected water balance for the period 1980-2004. The reservoir water levels so determined are assigned with higher water levels conforming to the monthly volume that can be processed by the additionally installed unit number 5. The idea is to operate the power plant at higher water levels (with unchanged water balance) whereby the existence of unit number 5 enables, if needed, to switch to lower levels of the reservoir.

As to the second factor, the additional energy generation is realized when unit 5 is in operation because of overflowing of the Studen Kladenets reservoir. Within the timeframe of the analyzed 25-year period the reservoir has overflowed in the course of 36 days (864 hours) per year in average.

In conclusion, as a result of the rehabilitation works, the energy generation by the Studen Kladenets HPP is due to the following main factors:

- Capacity and ability to maintain higher water levels of the Studen Kladenets reservoir resulting from the enhanced flexibility of the power plant with the installation of an additional hydro unit number 5;
- Capacity and ability to generate additional energy from the Studen Kladenets overflowing water;
- Additional energy production due to the improved efficiency of the electrical and mechanical equipment installed in the power plant.

None of the above three factors is related to any change in the modes of outflow, respectively water balances of reservoirs Kardjali, Studen Kladenets and Ivailovgrad. This means that the rehabilitation of Studen Kladenets HPP and in particular the installation of the additional unit number 5 cannot be a reason for any reduced energy generation by the existing hydropower plants within the cascade. With the rehabilitation of the said hydropower plants, the energy output will be increased as a result of the improved efficiency of the electrical and mechanical equipment installed thereto.

Issue 3
Inconsistency in project emissions
There are inconsistencies in the PDD e.g. page 16 the PDD states the project produces no emissions, yet on page 24 significant project emissions are given.

Project participant's response:
The hydro power project itself does not produce any GHG emissions (stated on page 16 of the PDD). The figure given in table E1.1 on page 24 of the PDD represent total CO2 emissions of all power plants connected to the national power grid in the *project scenario* with its specific operating regimes (e.g. for 2008: 28.556 million t CO2). This figure is compared to the total CO2 emissions in the *baseline scenario* (2008: 28.595 million t CO2). The difference is the resulting CO2 emission reduction (2008: 38.285 kt CO2).

Issue 4
Effect on pump storage plants
Furthermore this project according to the baseline study will have a side effect which is reflected in an increase of electricity consumption for pump storage power plants. This issue is not covered neither is additional consumption deducted from the envisaged project output.

Project participant's response:
In the determination report DNV asked for clarification on the pumping storage issue. DNV accepted this clarification. The project has also an effect on Pumping Storage HPP Chaira and other plants but as the baseline study considered the project's effect on the 4 power plants representing the top 35% of the electricity grid, in terms of total generation in 2012, the nonconsideration of Chaira is minor.

The project developer can deliver the following additional information:
The fourteen relatively largest hydro power plants and pumped-storage hydro power plants run by NEK EAD are grouped in 4 hydro power cascades: Belmeken-Sestrimo-Batak (BSB), Vacha, Batak and Dolna Arda. These cascades are mainly used for generating electricity to cover peak loads and regulate system power and frequency. The three pumped-storage hydro power plants (PSHPP) are located within the first two cascades BSB and Vacha. The Batak and Dolna Arda cascades are not equipped with a PSHPP. In pumping mode, the PSHPP operates mainly during night time to compensate for the over generation by thermal power plants (TPP) and the nuclear power plant (NPP) which cannot reduce their load although the system demand is low. A PSHPP never runs in pumping mode to compensate for the power generation by other hydro power plants in the system because such operation is economically inefficient. Additionally, it will be penalized by the Ministry of Environment and Water for non-observance of the monthly schedules of reservoir water utilization.

We sincerely hope that the JISC accepts our above explanations.

Yours faithfully

in name of the project participant NEK

Christian Steinreiber

Carbon Consultant

Pöyry Energy GmbH, Vienna

ANNEX 1 Authorisation of Pöyry by NEK to communicate with the JISC

NATSIONALNA ELEKTRICHESKA KOMPANIA EAD
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To
JI Team
UNFCCC Secretariat
JI-InfoSystem/UNF
Mr. Francisco Arango
Associate Programme Officer

Sofia, 14th November 2007

Gentlemen:

Herewith we provide, as required, details of NEK's contact persons for the review process of the determination regarding the PDD for "0040 Rehabilitation of Dolna Arda Hydropower Cascade, Bulgaria":

Mr. Assen Nikolov, Head of Corporate Finance -
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e-mail: assen.n@nek.bg

Mr. Christo Schwabski, Environmental Expert
Tel.: +359 2 9263 445
Fax: +359 2 9263 504
e-mail: hshvabski@nek.bg

NEK authorises the Pöyry Company to answer all questions connected with the JI Project after co-ordination with NEK.

Yours sincerely,

Lubomir Velkov
Chief Executive Director

ANNEX 2 Cash flow analysis of Dolna Arda project

Cash flow anaylsis without ERU revenues

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
[1,000 EUR]	**-4**	**-3**	**-2**	**-1**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**
P&L																									
REVENUE GAIN																									
Electricity Sales (2005: 40.9 EUR/MWh, inflation: 1.5-2%)	0	1.344	4.470	6.030	7.651	9.221	10.695	12.224	13.810	15.455	17.160	18.926	20.757	22.653	24.617	26.651	27.184	27.727	28.282	28.848	29.424	30.013	30.613	31.225	31.850
ERU Sales (8 EUR/tCO2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**1.344**	**4.470**	**6.030**	**7.651**	**9.221**	**10.695**	**12.224**	**13.810**	**15.455**	**17.160**	**18.926**	**20.757**	**22.653**	**24.617**	**26.651**	**27.184**	**27.727**	**28.282**	**28.848**	**29.424**	**30.013**	**30.613**	**31.225**	**31.850**
COSTS																									
O&M costs	9.282	9.514	9.689	9.867	12.524	12.710	12.899	13.092	13.289	13.490	13.695	13.904	14.117	13.565	13.787	14.013	14.243	14.479	14.719	14.964	15.214	15.468	15.728	15.993	13.789
EBIT	-9.282	-8.170	-5.219	-3.837	-4.873	-3.489	-2.204	-868	521	1.965	3.465	5.022	6.640	9.089	10.831	12.638	12.940	13.248	13.563	13.884	14.211	14.545	14.885	15.232	18.061
minus Financial Costs	1.311	1.004	1.379	1.802	2.197	2.222	1.907	1.591	1.276	961	746	631	517	402	287	172	57	0	0	0	0	0	0	0	0
EBT	-10.592	-9.175	-6.599	-5.640	-7.070	-5.711	-4.111	-2.460	-755	1.003	2.718	4.391	6.123	8.687	10.544	12.466	12.883	13.248	13.563	13.884	14.211	14.545	14.885	15.232	18.061
Corporate Tax (15%)	-1.589	-1.376	-990	-846	-1.061	-857	-617	-369	-113	151	408	659	918	1.303	1.582	1.870	1.932	1.987	2.034	2.083	2.132	2.182	2.233	2.285	2.709
Cash Flow																									
From Activity	-8.512	-7.400	-4.449	-3.067	-1.628	-244	1.041	2.377	3.766	5.210	6.710	8.267	9.885	11.564	13.306	15.113	15.415	15.723	16.038	16.359	16.686	17.020	17.360	17.707	18.061
Debt Service	1.311	1.004	1.379	1.802	2.197	9.881	9.566	9.251	8.935	8.620	4.920	4.805	4.691	4.576	4.461	4.346	4.232	0	0	0	0	0	0	0	0
Cash after Debt Service	-9.822	-8.405	-5.829	-4.870	-3.825	-10.125	-8.525	-6.874	-5.170	-3.411	1.789	3.462	5.194	6.988	8.845	10.767	11.184	15.723	16.038	16.359	16.686	17.020	17.360	17.707	18.061
Tax	-1.589	-1.376	-990	-846	-1.061	-857	-617	-369	-113	151	408	659	918	1.303	1.582	1.870	1.932	1.987	2.034	2.083	2.132	2.182	2.233	2.285	2.709
Cash after Tax	-8.234	-7.029	-4.839	-4.024	-2.765	-9.268	-7.908	-6.505	-5.056	-3.561	1.382	2.803	4.276	5.685	7.263	8.897	9.251	13.736	14.003	14.276	14.554	14.838	15.127	15.422	15.352
Investment Analysis																									
Investment	17.914	8.415	10.890	10.890	9.405	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cash From Activity	-8.512	-7.400	-4.449	-3.067	-1.628	-244	1.041	2.377	3.766	5.210	6.710	8.267	9.885	11.564	13.306	15.113	15.415	15.723	16.038	16.359	16.686	17.020	17.360	17.707	18.061
Project Cash Flow	**-26.426**	**-15.815**	**-15.339**	**-13.957**	**-11.033**	**-244**	**1.041**	**2.377**	**3.766**	**5.210**	**6.710**	**8.267**	**9.885**	**11.564**	**13.306**	**15.113**	**15.415**	**15.723**	**16.038**	**16.359**	**16.686**	**17.020**	**17.360**	**17.707**	**18.061**

IRR on Investment	**6,51%**
NPV (with 5,8%)	**11.575**

Cash flow anaylsis with ERU revenues

Year	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
[1,000 EUR]	**-4**	**-3**	**-2**	**-1**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**
P&L																									
REVENUE GAIN																									
Electricity Sales (2005: 40.9 EUR/MWh, inflation: 1.5-2%)	0	1.344	4.470	6.030	7.651	9.221	10.695	12.224	13.810	15.455	17.160	18.926	20.757	22.653	24.617	26.651	27.184	27.727	28.282	28.848	29.424	30.013	30.613	31.225	31.850
ERU Sales (8 EUR/tCO2)	0	0	0	306	369	452	509	504	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**0**	**1.344**	**4.470**	**6.336**	**8.020**	**9.673**	**11.204**	**12.728**	**13.810**	**15.455**	**17.160**	**18.926**	**20.757**	**22.653**	**24.617**	**26.651**	**27.184**	**27.727**	**28.282**	**28.848**	**29.424**	**30.013**	**30.613**	**31.225**	**31.850**
COSTS																									
O&M costs	9.282	9.514	9.689	9.883	12.543	12.733	12.925	13.118	13.289	13.490	13.695	13.904	14.117	13.565	13.787	14.013	14.243	14.479	14.719	14.964	15.214	15.468	15.728	15.993	13.789
EBIT	-9.282	-8.170	-5.219	-3.546	-4.523	-3.059	-1.721	-390	521	1.965	3.465	5.022	6.640	9.089	10.831	12.638	12.940	13.248	13.563	13.884	14.211	14.545	14.885	15.232	18.061
minus Financial Costs"	1.311	1.004	1.379	1.802	2.197	2.222	1.907	1.591	1.276	961	746	631	517	402	287	172	57	0	0	0	0	0	0	0	0
EBT	-10.592	-9.175	-6.599	-5.349	-6.719	-5.281	-3.628	-1.981	-755	1.003	2.718	4.391	6.123	8.687	10.544	12.466	12.883	13.248	13.563	13.884	14.211	14.545	14.885	15.232	18.061
Corporate Tax (15%)	-1.589	-1.376	-990	-802	-1.008	-792	-544	-297	-113	151	408	659	918	1.303	1.582	1.870	1.932	1.987	2.034	2.083	2.132	2.182	2.233	2.285	2.709
Cash Flow																									
From Activity	-8.512	-7.400	-4.449	-2.776	-1.278	186	1.524	2.855	3.766	5.210	6.710	8.267	9.885	11.564	13.306	15.113	15.415	15.723	16.038	16.359	16.686	17.020	17.360	17.707	18.061
Debt Service	1.311	1.004	1.379	1.802	2.197	9.881	9.566	9.251	8.935	8.620	4.920	4.805	4.691	4.576	4.461	4.346	4.232	0	0	0	0	0	0	0	0
Cash after Debt Service	-9.822	-8.405	-5.829	-4.579	-3.474	-9.695	-8.042	-6.395	-5.170	-3.411	1.789	3.462	5.194	6.988	8.845	10.767	11.184	15.723	16.038	16.359	16.686	17.020	17.360	17.707	18.061
Tax	-1.589	-1.376	-990	-802	-1.008	-792	-544	-297	-113	151	408	659	918	1.303	1.582	1.870	1.932	1.987	2.034	2.083	2.132	2.182	2.233	2.285	2.709
Cash after Tax	-8.234	-7.029	-4.839	-3.777	-2.466	-8.903	-7.498	-6.098	-5.056	-3.561	1.382	2.803	4.276	5.685	7.263	8.897	9.251	13.736	14.003	14.276	14.554	14.838	15.127	15.422	15.352
Investment Analysis																									
Investment	17.914	8.415	10.890	10.890	9.405	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cash From Activity	-8.512	-7.400	-4.449	-2.776	-1.278	186	1.524	2.855	3.766	5.210	6.710	8.267	9.885	11.564	13.306	15.113	15.415	15.723	16.038	16.359	16.686	17.020	17.360	17.707	18.061
Project Cash Flow	**-26.426**	**-15.815**	**-15.339**	**-13.666**	**-10.683**	**186**	**1.524**	**2.855**	**3.766**	**5.210**	**6.710**	**8.267**	**9.885**	**11.564**	**13.306**	**15.113**	**15.415**	**15.723**	**16.038**	**16.359**	**16.686**	**17.020**	**17.360**	**17.707**	**18.061**

IRR on Investment	**6,66%**
NPV (with 5,8%)	**13.008**