

DARICA-1 99 MW Hydro Power Plant

Document Prepared By TÜV NORD CERT GmbH

Project Title	DARICA-1 99 MW Hydro Power Plant
Version	01
Project ID	506
Report ID	VCSVER-8000405921

Report Title	2 nd Verification report "DARICA-1 99 MW Hydro Power Plant"
Client	EcoSecurities International Limited
Pages	40
Date of Issue	15 th March 2012
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Summary:

- DARICA-1 99 MW Hydro Power Plant is a hydropower plant with total installed capacity of 112.42 MW consisting of two turbines each with an installed capacity of 56.21 MW and two synchronous generators with a total rated output of 112 MVA. The project is expected to generate 410,000 MWh per year and to export electricity to the rapidly growing Turkish energy market.
- This is the 2nd periodic verification for this project and the purpose is to ensure that the project is still operating in accordance with the project description and monitoring report.
- The method for the verification consists of document review, interview of relevant entities and on-site assessment by following the criteria required by the VCS standard version 03.2.
- From the result of this 2nd periodic verification, the verifier team confirms that the project has achieved emission reductions as mentioned in the reporting period from 1st December 2010 to 31st December 2011.

Abbreviations

BAU	Business as usual
CA	Corrective Action / Clarification Action
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CO₂	Carbon dioxide
CO_{2e}	Carbon dioxide equivalent
CP	Certification Program
CL	Clarification Request
DWRM	Department of Water Resources Management
DNA	Designated National Authority
EB	CDM Executive Board
EIA	Environmental Impact Assessment
ER	Emission Reduction
FAR	Forward Action Request
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
MP	Monitoring Plan
MR	Monitoring Report
PO	Project Owner, in this report means Yapısan Elektrik Üretim Anonim Şirketi
PMUM	Piyasa Mali Uzlaştırma Merkezi (Market Financial Reconciliation Center)
PDD	Project Design Document
QC/QA	Quality control/Quality assurance
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Voluntary Carbon Standard
VCS	VCS - Project Description
VCU	Voluntary Carbon Unit
VVM	Validation and Verification Manual

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1 INTRODUCTION

EcoSecurities has commissioned the TÜV NORD JI/CDM Certification Program to carry out the verification of the project:

“DARICA-1 99 MW Hydro Power Plant”

with regard to the relevant requirements of the Voluntary Carbon Standard 2011^{/VCS/}. The verifiers have reviewed the implementation of the monitoring plan (MP) in the registered VCS project for the monitoring period 1st December 2010 to 31st December 2011 (both dates included).

The applied monitoring methodology is “Consolidated baseline methodology for grid connected electricity generation from renewable sources” (ACM0002 version 7)

1.1 Objective

The purpose of this 2nd verification is to have an independent third party assessment of the project design, in particular, the project's baseline, the additionality, the monitoring plan (MP) and the project's compliance with regards to:

- The requirements of VCS version 3.2 program guidelines;
- “Consolidated baseline methodology for grid connected electricity generation from renewable sources” (ACM0002 version 7)
- other relevant rules, including the host country, Turkey;
- legislation and sustainability criteria

The verification has been carried out with the purpose of independent checking of objective evidence, as follows:

- to verify that the project is implemented as described in the registered project design document and supplement PD documents;
- to assess the implementation of the monitoring plan (MP) content in the VCS-PD;
- to assess the project's compliance with other relevant rules, including the host country (Turkey) legislation;
- to confirm that the monitoring system is implemented and fully functional to generate voluntary emission reductions (VERs / VCUs) without any double counting; and
- to establish that the data reported are accurate, complete, consistent, transparent and free of material error or omission by checking the monitoring records and the emissions reduction calculation to confirm that the monitoring system is implemented and fully functional to generate voluntary emission reductions (VERs / VCUs) without any double counting; and to establish that the data reported are accurate, complete, consistent, transparent and free of material error or omission by checking the monitoring records and the emissions reduction calculation.

The verification is to ensure that the implementation of the project is compliant with the regulations and to ensure that the amount of emissions reductions claimed for is correct.

1.2 Scope and Criteria

The scope of the verification covers review of the PDD and the Monitoring Report as required by the Policy Announcement from VCS Association. The verification scope is given as an independent and objective review of the project design, the project's baseline study and

monitoring plan based on “Consolidated baseline methodology for grid connected electricity generation from renewable sources” (ACM0002 version 7), valid at the time of UNFCCC registration, which is included in the VCS PD, Monitoring report and other relevant supporting documents.

The items covered in the verification are described below:

- VCS version 3.2 and Project Country Criteria
- Project Description
- Project Baseline
- Monitoring Plan
- Calculation of GHG Emissions
- Background investigation and follow up interviews
- Draft verification report with CARs, CLs & FARs, if any

The information included in the Project Description, Monitoring Report and supporting documents were reviewed against the requirements and criteria mentioned above. The TÜV NORD CERT GmbH JI/CDM CP has employed a risk-based approach in the verification, focusing on the identification of significant risks for project implementation and the generation of VERs. The verification is based on the information made available to TÜV NORD JI/CDM CP on the contract conditions and supporting documents made available to the DOE. This includes the information collected through performing interviews during the on-site assessment. Furthermore publicly available information was considered as far as available and required.

The assessment is not meant to provide any consulting to the project participant. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project design. TÜV NORD JI/CDM CP has employed a risk-based approach in verification, focusing on the identification of significant risks and reliability of project monitoring and generation of emission reductions.

1.3 Appointment of team members and technical reviewer

On the basis of a competence analysis and individual availabilities, a verification team was appointed. Furthermore the personnel for the technical review and the final approval was determined. The list of involved personnel, the tasks assigned and the qualification status are summarized in the table 1-1 below.

Table 1-1: Involved Person

	Name	Company	Function ¹⁾	Qualification Status ²⁾	Scheme competence ³⁾	Technical competence ⁴⁾	Verification competence ⁵⁾	Host country Competence	On-site visit
☒ Mr. ☐ Ms.	Alexander Richter	TN CERT Germany	TL	LA	☒	1.2	☒	☐	☒
☒ Mr. ☐ Ms.	Martin Saalman	TN CERT Germany	TM ^{A)}	SA	☒	1.2	☒	☐	☐

	Name	Company	Function ¹⁾	Qualification Status ²⁾	Scheme competence ³⁾	Technical competence ⁴⁾	Verification competence ⁵⁾	Host country Competence	On-site visit
☐ Mr. ☒ Ms.	Büsrhan Grünenwald	TN CERT Germany	TM	A	☐		☒	☒	☐
☒ Mr. ☐ Ms.	Samir Beqqal	TN CERT Germany	TR ^{B)}	LA	☒		☒	☐	-
☒ Mr. ☐ Ms.	Ingo Klein	TN CERT Germany	TR ^{B)} / FA ^{B)}	SA	☒	1.2	☒	☐	-

¹⁾ TL: Team Leader; TM: Team Member; TR: Technical review; OT: Observer-Team; OR: Observer-TR; FA: Final approval

²⁾ GHG Auditor Status: A: Assessor; LA: Lead Assessor; SA: Senior Assessor; T: Trainee; TE: Technical Expert

³⁾ GHG auditor status (at least Assessor)

⁴⁾ As per S01-MU03 or S01-VA070-A2 (such as 1.1, 1.2, ...)

⁵⁾ In case of verification projects

A) Team Member: GHG auditor (at least Assessor status), Technical Expert (incl. Host Country Expert or Verification Expert), not ETE

B) No team member

1.4 Level of assurance

The verification has been planned and organized to achieve a

- ☒ reasonable level of assurance
- ☐ limited level of assurance.

1.5 Summary Description of the Project

Yapısan Elektrik Üretim Anonim Şirketi is the project developer, owner and operator, and are responsible for gathering the Monitoring Data. J.P. Morgan Ventures Energy Corporation is the buyer of the emission reductions and is responsible for writing the Monitoring Report and submitting to the DOE^{/IM01/ - /IM02/}.

The purpose of the Project is to export the generated electricity to the regional grid, thereby contributing to the Turkey's electricity demand and rapidly growing economy. Since the Project generates electricity from renewable energy resources, it makes a significant contribution to climate protection. According to the validated PDD, the Project (at 99 MW capacity) was expected to generate ca. 327,690 MWh of electricity annually, and to reduce 209,722 tonnes of CO₂ emissions per year, by supplying renewable energy that would have been supplied by the existing power grid that generates electricity predominantly from fossil fuel powered thermal power plants. During the operation phase the capacity of the project was increased to 112.42 MW (2 x 56.21 MW turbines) and the generator capacity was increased to 112 MVA (2 x 56 MVA)^{/MES/}. Accordingly, the expected annual electricity generation was also increased to 410,000 MWh. This is accomplished with the manufacturer's assistance, by adjusting the turbines to their maximum limits^{/IM01/}.

The Project is constructed on the Melet River in the Mesudiye district, Ordu Province, 4 km Northeast of Topçam District, on the tail water downstream of the Topçam Hydroelectric Power Plant. The Melet River flows in a Northerly direction and has a length of ca. 165 km.^{/IM01/ - /IM02/ValR/VerR/PD/} The annual mean flow rate, fed by snow and rain water, is 27 m³/sec. The region has steep topography and the altitude of the catchment area extends to 1,469 meters. The river itself falls from 650 meters to 335 meters at the Project site.

Project construction commenced in April 2007, and the first turbine began operating on 10/10/2009. On 23/12/2009, the second turbine began operating, and the Project has been operational since^{/VerR/FIP/}.

This second monitoring period covers the 13 months from 01/12/2010 to 31/12/2011 (both days included). The total emission reductions achieved in this period are 182,360 tonnes of CO₂e.

The on-site visit was conducted on 28th February to 1st March 2012 to confirm the project location, installation and operation as per the PD. During the site visit the equipment installed and operation of the hydro power plant were checked.

The project location as confirmed in table 1-2.

Table 1-2: Project Location^{/IM01/PD/ValR/PL/}

Item	Project scope
Host country:	Turkey
Region:	Mesudiye district, Ordu province, Turkey
Project address:	Melet River in the Mesudiye District of Ordu Province (12 km Northeast of Topçam)
Latitude	40°43' 51" N
Longitude	37° 51' 30" E.

The sources and green house gases (GHGs) of the project activity as illustrated in table 3 of the registered PDD regarding the CO₂ emission from grid electricity were confirmed during the onsite visit.

The project activity will contribute to the sustainable development as below:

- Increasing the supply of electricity from sustainable resources
- Reducing the demand for new thermal power plants using fossil fuels and the dependency on imported energy sources.
- Ensuring sufficient, reliable and clean energy in order to support social and economic development.
- Encouraging investment in renewable energy sources to meet growing energy demand.
- Providing easier access to villages in the region through newly built roads.
- Provide employment for locals.

Essential data of the project is presented in the following Tables 1-3 and 1-4.

Table 1-3: Project Characteristics

Item	Data
Project title	DARICA-1 99 MW Hydro Power Plant
Project owner	Yapısan Elektrik Üretim Anonim Şirketi
Any specific project categories	☐ Mega projects (> 10 ⁶ t CO _{2eq} / a) ☒ Projects (≤ 10 ⁶ t CO _{2eq} / a)
VCS MR dated	Draft: 26 January 2012 Final: 15 March 2012

Applied Methodology	“Consolidated baseline methodology for grid connected electricity generation from renewable sources” (ACM0002 version 7),	
Project starting date	10 October 2009	
Crediting period	☐	Renewable Crediting Period (10 y)
	☒	Fixed Crediting Period (10 y)
Start of crediting period	10 October 2009	

Table 1-4: Technical data of the project ^{/MES/}

Parameter / Item	Unit / Details	Value
Turbine		
Manufacturer	-	Voith Siemens Hydro Power Generation
Type	-	Vertical Francis Spiral Turbine
Number of units	No.	2
Capacity	MW	56.21
Rated speed	rpm	600
Generator		
Manufacturer	-	Voith Siemens Hydro Power Generation
Type	-	Synchronous Generator
Number of units	No.	2
Capacity	MVA	56
Power Factor	-	0.9
Frequency	Hz	50
Rated Speed	rpm	600
Number of Poles	-	10

2 VALIDATION PROCESS, FINDINGS AND CONCLUSION

N/A

2.1 Validation Process

- Method and Criteria:

N/A

- Review:

N/A

- Interviews:

N/A

Table 2-1: Interviewed persons and interview topics

Interviewed Persons / Entities	Interview topics
	• General aspects of the project • Technical equipment and operation • Changes since implementation • Monitoring and measurement equipment • Remaining issues from validation • Calibration procedures • Quality management system • Involved personnel and responsibilities • Training and practice of the operational personnel • Implementation of the monitoring plan • Monitoring data management • Data uncertainty and residual risks • GHG calculation • Procedural aspects of the verification • Maintenance • Environmental aspects • Editorial issues of the Monitoring Report

- Site Inspections:

N/A

- Resolution of Any Material Discrepancy:

N/A

Table 2-2: Summary of Validation Finding

No.	Topic / Chapter	CAR	CL	FAR
1	Project Detail			-
2	Application of Methodology	-	-	-
3	Quantification of GHG Emission Reductions and Removals	-	-	-
4	Monitoring	-	-	-
5	Environmental Impact	-	-	-
6	Comments by Stakeholders	-	-	-
	SUM			-

Table 2-3: Revision of PD

PD Version No.	Date	Remark

2.2 Validation Findings

N/A

2.2.1 Gap Validation

Related Findings

- ☐ No CARs, CLs or FARs have been identified in this context
- ☐ The following finding(s) have been addressed:

Gap Validation	2.2.		
Classification	☐ CAR	☐ CL	☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>			
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>			
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>			
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the next periodic verification ☐ Appropriate action was taken ☐ Project documentation was corrected correspondingly ☐ Additional action should be taken		

	☐ The project complies with the requirements
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Final Assessment

N/A

2.2.2 Methodology Deviations

N/A

2.2.3 New Project Activity Instances

N/A

2.3 Validation Conclusion

N/A

3. Verification Process

3.1 Method and Criteria

The verification of the project consisted of the following steps:

- Contract review;
- Appointment of team members and technical reviewers;
- Desk review of the Monitoring Report^{/MR/} submitted by the client and additional supporting documents.
- Verification planning;
- On-Site assessment;
- Background investigation and follow-up interviews with personnel of the project developer and its contractors;
- Draft verification reporting;
- Resolution of corrective actions (if any);
- Final verification reporting;
- Technical review;
- Final approval of the verification

Table 3.1: Verification sequence

Topic	Time
Assignment of verification	2012-02-20
On-site visit	2012-02-28 to 2012-03-01
Draft reporting finalised	2012-03-02
Final reporting finalised	2012-03-12
Technical review on final reporting finalised	2012-03-14
Final corrections and Approval	2012-03-15

The main verification steps are described below:

3.2 Document Review

The VCS PD^{/PD/} and supporting background documents related to the project design and baseline were reviewed. Furthermore, the verification team used additional documentation by third parties like host party legislation, technical reports referring to the project design or to the basic conditions and technical data. The references used in the course of this verification are summarized in section 6.

3.3 Interviews

The verification team has carried out interviews in order to assess the information included in the project documentation and to gain additional information regarding the compliance of the project with the relevant criteria applicable for the VCS. During verification the verification team has performed interviews to confirm selected information and to resolve issues identified in the document review. The main topics of the interviews were summarized in Table 3-2.

Table 3-2: Interviewed persons and interview topics

Interviewed Persons / Entities	Interview topics
Mr. Osman Fırat Alkan – Plant Manager Yapısan Elektrik Üretim Anonim Şirketi Ms. Burcu Kılıç – Project Carbon Manager Yapısan Elektrik Üretim Anonim Şirketi Mr. Amin Bekai – Senior Project Manager EcoSecurities International Limited	• General aspects of the project • Technical equipment and operation • Changes since implementation • Monitoring and measurement equipment • Remaining issues from validation • Calibration procedures • Quality management system • Involved personnel and responsibilities • Training and practice of the operational personnel • Implementation of the monitoring plan • Monitoring data management • Data uncertainty and residual risks • GHG calculation • Procedural aspects of the verification • Maintenance • Environmental aspects • Editorial issues of the Monitoring Report

3.4 Site Inspections

3.4.1 Review of Performance Records

The verification team adopted suitable methodology to ensure that the project is implemented and operated as per the registered PD. In order to verify that the project is implemented and operated as per the applicable criteria, chief of them being the conditions and specifications described in the PD, a site visit was performed by the team members to verify the equipment and instrument installed, check on the operation, accuracy of implemented monitoring methodology. The following items were verified in detail:

- Inspection electricity generation installed units whether they are consistent with peripherals equipment lists. The other equipments such as electrical switchgears, transformers, etc were installed and worked as planned and presented in the PD;
- Members of operating staff were interviewed and were observed in order to verify allegiance to stated methods of operation and monitoring;
- Information processes for generating, aggregating and reporting the selected monitored parameters were reviewed;

- The calibration for all metering equipment was checked;
- The monitoring processes, routines and documentations were audited to check their proper application;
- The monitoring data were checked; recording of hourly generation, aggregating of data, and monthly reports were verified;
- Maintenance procedures were verified

The on-site visits was conducted on 28th February to 1st March 2012 and held by the team leader.

During the site visit, the verification team was able to check and verify the following records:

- Daily electricity generation report which included details of running hours, total daily generation, auxiliary consumption and cumulative generation and consumption for each month;
- Outage register containing details of forced and planned outages, root cause analysis, and corrective actions implemented;
- Register containing hourly readings from the control room;
- Maintenance check list – mechanical and electrical – daily, weekly, monthly and annually;

The following equipments and instruments were checked:

- Turbine and Generator name plate details;
- Check and Main meters, type and serial numbers;
- Transformer details installed in the transformer yard
- Main control room instrumentation;

By means of site visit and documents review the team concluded that the accuracy and class of instruments in compliance with manufacturer' specifications as stated in the registered PD.

3.4.2 Collection of Measurements

The verification team has carried out interviews and reviews of records to assess if the collection of measurements is in accordance with the monitoring plan of the validated PD and the relevant VCS criteria. The collection and measurement of GHG emission reduction have been implemented in accordance with the approved monitoring plan contained in the registered PD. The monitoring is effective and reliable. The monitoring parameter are described as below:

1. The total electricity imported from the grid by the project activity for auxiliary consumption
2. The total electricity exported to the grid generated by the project activity
3. Net Electricity supplied by the project activity to the grid from the calculation
4. Diesel Consumption by the Diesel Generator Set to serve the electricity needs of the plant during non-generation periods

The amount of electricity is measured by grid electricity meter. This electricity meter continuously measures and records the generated and imported electricity accumulatively^{/IM01/}. The meters installed have been checked during the on site visit and from the Meter Reading Reports it is confirmed that the electricity is imported and measured by the installed metering devices. TEIAS, using a GSM device, reads the electricity generation / imports remotely, too^{/IM01/ValR/MRR/}. The record of data from internal electricity meter is aggregated on hourly, daily, and monthly basis to cross check the records with the data supplied by TEIAS through the remote meter reading^{/MRLB/}. Once a month either TEIAS personnel visit the site to read the meter together with plant staff or take the remote meter reading. Either the meter reading report is generated on site or the remote meter reading is used to develop the meter reading report after cross check by Yapısan Elektrik Üretim Anonim Şirketi. The meter reading report is finally signed by both TEIAS and

representatives of Yapısan Elektrik Üretim Anonim Şirketi and serves as official evidence for the electricity generated and consumed by the plant^{/IM01/ValR/MRR/}. Additionally, PMUM, the Market Financial Reconciliation Center (Piyasa Mali Uzlaştırma Merkezi) of TEIAS publishes the electricity generation / import values in monthly reports^{/PMUM/}. These reports, downloadable from <http://dgpys.teias.gov.tr/dgpys/> have been provided to the verification team and utilized for cross checks of the values stated in the monthly meter reading reports.

During the site visit it was confirmed that the details of meters connected at the hydropower plant are listed as follows:

Table 3-3: Parameters confirmed during verification^{/CC/TRMC/}

Tag no.	Equipment Detail	Serial no.	Installed period	Accuracy	Calibration frequency
Main Meter unit 1	Elster A1500-W043-741-OSL-1165X-V4H00	00361509	10.10.2009 – 28.02.2012	0.2s	Once in 10 years
Back-up meter unit 1	Elster A1500-W043-741-OSL-1165X-V4H00	00361510	10.10.2009 – 28.02.2012	0.2s	Once in 10 years
Main Meter unit 2	Elster A1500-W043-741-OSL-1165X-V4H00	00364713	23.12.2009 – 28.02.2012	0.2s	Once in 10 years
Back-up meter unit 2	Elster A1500-W043-741-OSL-1165X-V4H00	00364714	23.12.2009 – 28.02.2012	0.2s	Once in 10 years

By means of interviews as well as cross checks with the verification report of the first monitoring period and the first index protocols^{/FIP/} for the meters of unit 1 and unit 2 the verification team confirms that the above mentioned meters were installed throughout the whole monitoring period. Malfunctioning or exchange of meters could not be observed. The validity of calibration and the sound performance of the meters further substantiate the meter readings and electricity generation / consumption figures mentioned in the MR and verified in this report.

3.4.3 Observation of established practices and testing of the accuracy of monitoring equipment

During the on-site visit, the verification team has checked the test methods and practices established for the monitoring instruments. They are in accordance to local and international requirements and as in the validated PD. This is confirmed on the basis of the first index protocol for the main and back up meters signed by both TEIAS and Yapısan Elektrik Üretim^{/FIP/}. The documents refer to the installed (calibrated) meters and are used to confirm the validity of the calibration by the manufacturer (Elster) as per the national standard.

3.5 Resolution of Any Material Discrepancy

Material discrepancies identified in the course of the verification are addressed either as CARs, CLs or FARs.

A **Corrective Action Request (CAR)** is established where:

- errors have been made in assumptions, application of the methodology or the project documentation which will have a direct influence the project results,
- the requirements deemed relevant for verification of the project with certain characteristics have not been met or
- there is a risk that the project would not be registered or that emission reductions would not be able to be verified and certified.

A **Clarification Request (CL)** will be issued where information is insufficient, unclear or not transparent enough to establish whether a requirement is met.

A **Forward Action Request (FAR)** will be issued when certain issues related to project implementation should be reviewed during the next verification.

A detailed list of the CARs CLs and FAR raised and discussed in the course of this verification is included in the next section 4 of this report.

Table 3-4: Overview of CARs, CLs and FARs issued

No.	Topic / Chapter	CAR	CL	FAR
2.2.1	Gap Validation	-	-	-
2.2.2	Methodology Deviation	-	-	-
4.1	Project Implementation	3	9	2
4.2	Emission Reductions Calculations	3	-	-
4.3	Quality of Evidence	-	-	-
4.4	Management and Operational System	-	-	-
	SUM	6	9	2

A detailed list of CARs, CLs and FARs raised and discussed in the course of the verification is included in the next section 4 of this report.

Table 3-5: Revision of MR 2nd Monitoring Period

MR Version No.	Date	Remark
1.0	26 January 2012	1 st review - Initial Findings raised
2.0	05 March 2012	2 nd review - update / closure of findings
3.0	07 March 2012	3 rd review - closure of remaining findings
4.0	15 March 2012	4 th review - closure of TR findings

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

Description:

The DARICA-1 99 MW Hydro Power Plant commenced construction of the hydropower plant in April 2007. The project activity commenced exporting electricity to the Turkish grid on 10 October 2009 when the first turbine began operation. The second turbine commenced operation on the 23 December 2009^{/VerR/FIP/}.

This monitoring report provides an overview of the voluntary emission reductions generated by the project activity for the purpose of verification against the Voluntary Carbon Standard (VCS version 3.2), covering the monitoring period of 01 December 2010 to 31 December 2011 (inclusive of both days).

During the site visit, it was confirmed that two vertical spiral Francis turbines with total capacity 112.42 MW and two synchronous generators with total capacity 112 MVA are installed for electricity generation.

However, changes to the key equipments since validation of the project have been observed. This mainly comprises the increase in the capacity of the turbines as well as the generators through optimisation measures^{/IMO1/}. The installed capacity of 55.16 MWe per generator is derived from the electricity generation license checked on site and submitted for verification^{/EGL/}. The actually installed apparent power, however, is 56 MVA as per the generators' nameplates^{/MES/}. Considering the power factor of 0.9 the active power amounts to 50.4 MW, which is lower than the power determined in the electricity generation license. On the basis of cross checks with the meter reading reports^{/MRR/} the verification team confirms that the 50.4 MW also tally with the actual maximum generation values per hour, which are always lower than 50.4 MW. Moreover, during interviews with the plant manager it was noticed that Yapısan Elektrik is not free to decide to run the plant at its maximum as this is decided by TEİAŞ according to the electricity demand and supply in the grid^{/IMO1/}.

The increased capacity of the generation equipment has been assessed against the requirements of EB 48, Annex 66 and the verification team confirms that the changes do not affect the additionality of the project activity. In this respect the additionality approach as per the registered PDD (barrier analysis) has been analysed and checked whether the above mentioned modifications affect the additionality of the project. The barriers determined in the PD mainly comprise the following:

Investment barrier and technological barriers:

- low debt availability of 64% requires more equity compared to other investments such as wind projects, which gain up to 85% debt
- the risk of fluctuating and even worse, lower electricity generation than estimated faced by the PP as well as the bank providing the loan
- the hydrological situation, i.e. the water availability in future is difficult to predict and may aggravate due to climate change; consequently may lead to lower revenues
- the difficult terrain, which is relevant especially during construction of the tunnels, caused higher investment costs of ca. 27% compared to the original analysis

In light of the summary of barriers mentioned above the verification team deem it appropriate to assume that the barriers are still valid though the modifications in the installed capacity of the major equipment occurred. Though the equipment is mechanically capable to generate more electricity it is uncertain that the water necessary to utilise the higher capacity will be available in future. This is also expressed in the barriers itself. The reason to increase the capacity of the equipment was the higher water availability in the Topçam Dam (located above the Project).

Since the Topçam Dam's full capacity can probably not be utilised in future, because this project as well as another project close to the site is or is going to be in operation, respectively, it is uncertain that the modifications in the equipment can be utilised at all. Moreover, as described above TEIAS influence the electricity generation considerably in order to stabilise the grid. Thus, the verification team is convinced that the debt / equity ratio would remain the same and the bank's / PP's perception of the risks associated with the water availability still hold true. Finally, the unexpected increase in construction costs is also not affected by the capacity increase. Against this backdrop the DOE is convinced that the additionality of the project activity is not affected by the changes made to the original project design. Consequently, the DOE confirms conformity with the guidelines of EB 48, Annex 66.

The monitoring methodology was in accordance with the chosen methodology. The equipment and instruments installed for monitoring of the project activity were sufficient.

The verification site visit was conducted on 28th February to 1st March 2012. During the site visit it was confirmed that there was no alteration or changes of the monitoring instruments and continued to be in line with the description as described in the registered PD.

During this monitoring period 01 December 2010 to 31 December 2011 the project exported 284,953,340 kWh of net electricity to the Turkish grid. Two main and backup meters were installed which are located at the grid connection point. The main meters are defined as the invoice meters. Backup meters are installed to cross check that the reading is similar as the main meter. In case of malfunctions of the main meters beyond the permissible limit the backup meters are used for invoicing^{/IM01/PD/VaIR/MR/}. During this verification it was noticed that changes in the regulation occurred so that the power company no longer showing meter readings on their invoices. As such information from the MFRC/PMUM is used to cross check the electricity generation / consumption values as per the meter reading reports^{/PMUM/REMBS/}.

The verification team found the following findings:

Related Findings

- ☐ No CARs, CLs or FARs have been identified in this context
- ☒ The following finding(s) have been addressed:

Finding	4.1-1
Classification	☒ CAR ☐ CL ☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Section 1.1: According to the MR the total emissions reductions achieved during this period is 182,366 tCO ₂ e. However, the Excel spreadsheet calculations suggest it is 182,370 tCO ₂ e. Please explain this difference and distinguish between BE, PE and ER.
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	Emission reductions per MR were correctly stated and named. What was referred to as "Emission Reduction Achieved" (in columns "F" and "G" in the "Emission Reductions" tab of the ER spreadsheet) have been renamed correctly (in addition to the tab name), since they refer to the baseline and <i>not</i> the emission reductions. The corrected ER spreadsheet (filename: "Darica 2nd Monitoring Period v2 05 03 2012") accompanies this response.
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The terminology is not correctly applied, i.e. "baseline emission reductions" has been stated. PP is requested to use the correct terminology. The input values as well as the ER-calculation, arithmetically, have been checked and its correctness is confirmed.

Corrective Action #2 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The terminology throughout the project documentation has been corrected. The revised MR (filename: "Darica VCS 2nd verification v3 07 03 2012") and ER spreadsheet (filename: "Darica 2nd Monitoring Period v3 07 03 2012") accompany this response.
DOE Assessment #2 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The improvements in version 3 of the MR w.r.t. the terminology have been checked and deemed correct. Now, the input values, the formulae as well as the terminology are correct. The CL is closed.
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the next periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

Finding	4.1-2
Classification	☐ CAR ☒ CL ☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Section 1.3: - According to the VCS website, the only PP is YAPISAN ELEKTRIK URETIM A.S. The MR and PDD also include JP Morgan Ventures Energy Corporation. Please clarify this. - The contact person is missing
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The MR has been prepared (as always) with the PDD as the reference, and this was accepted in the previous verification (by a different DOE), with the VCS subsequently issuing the credits. The VCS website indeed only includes the project owner, "YAPISAN ELEKTRIK URETIM A.S." as a PP, since the VERPA signed between J.P. Morgan Ventures Energy Corporation and Yapisan Elektrik ends on 31/12/2012, and J.P. Morgan Ventures Energy Corporation should not be included as one of the PPs (for the whole crediting period (i.e. on the VCS website)). The contact person for YAPISAN ELEKTRIK URETIM A.S. has been added (in the relevant table in Section 1.3) to the updated version of the MR that accompanies this response (filename: "Darica VCS 2nd verification v2 05 03 2012").
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	Since the participation of JP Morgan is valid for the 2nd monitoring period, though may not continue in future it is deemed appropriate to mention both, YAPISAN ELEKTRIK URETIM A.S. and JP Morgan Ventures Energy Corporation in the MR of the 2nd verification. The contact person of YAPISAN ELEKTRIK URETIM A.S. / Bilgin Energy has been mentioned correctly.
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

Finding	4.1-3
Classification	☐ CAR ☒ CL ☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Please rectify all punctuation errors in the MR version 1, e.g. section 2 and 4 and synchronize the statements with the ER-spreadsheet.
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	All punctuation errors have been corrected in the latest version of the MR (filename: "Darica VCS 2nd verification v2 05 03 2012"), so as to synchronise with the latest version of the ER spreadsheet (filename: "Darica 2nd Monitoring Period v2 05 03 2012").
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The punctuation and correspondingly the units used in section 2 and 4 as well as other sections have been corrected. The statements are now precise to serve the purpose. However, the installed capacity of the generator refers to the capacity as per the license, which is slightly different from the installed capacity (apparent power) of the generators as per the nameplates. The PP is requested to mention the installed capacity of the generators as per the nameplates.
Corrective Action #2 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The installed capacity of the generators (as per their nameplates) have been included and employed (in the calculations) in the appropriate MR sections. The revised MR (filename: "Darica VCS 2nd verification v3 07 03 2012") accompanies this response.
DOE Assessment #2 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	All relevant sections were improved as per the assessments / response above. The MR version 3 is now reflecting the correct and actually installed capacity values of the generators. CL 4.1-4 is closed on that basis.
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the next periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

Finding	4.1-4
Classification	☐ CAR ☒ CL ☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Section 2.2 (a) Please further specify the role of MFRC and describe how they provide electricity export / import values for the project. (b) When did the regulatory change come in meaning that invoices no longer show the electricity being produced? Please evidence this regulation.

Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	(a) Section 2.2 of the latest MR (filename: "Darica VCS 2nd verification v2 05 03 2012") has been updated accordingly. (b) (i) The transition from 'old' to 'new' system transpired on 11-12/2009. For further details, please refer to the Verification Report for the previous monitoring period (already provided to TÜV-N at the site visit of 29/02/2012), p. A-6 (or p. 32 of 61 of that PDF document), noting that this was accepted by the DOE and VCS, with the VERs for that verification subsequently issued. (ii) The Regulation of Electricity Market Balancing and Settlement was published on 14/04/2009, but came into effect at the plant later that year. Please refer to: www.epdk.gov.tr/web/elektrik-piyasasi-dairesi/26 for further details.
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	(a) The role of MFRC as well as the process of how the electricity values determined in the meter reading reports become official has been clarified in the MR. The process described is the general procedure followed by TEIAS and has been confirmed during interviews on site with the PP. (b) The decision making context as per the FVerR of the first monitoring period is not traceable. The size of the document referred to under the link stated above is 59 pages. Either specify the paragraph in the document or submit invoices which prove that the electricity generated is no longer mentioned.
Corrective Action #2 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	(b) Article 128 (4) (p. 54/59 of the MSWord download) of The Regulation of Electricity Market Balancing and Settlement published (14/04/2009) [www.epdk.gov.tr/web/elektrik-piyasasi-dairesi/26] states that the Market Operator provides each company a final settlement document which includes: a) A breakdown of total energy sold to the system including the market participant's (i.e. the company's) receivables for the related settlement period b) A breakdown of total energy taken from the system including the market participant's (i.e. the company's) payables for the related settlement period It can be seen from the above, that the PMUM Settlement Declaration does not state the energy sold and receivables on a project-by-project basis, but only on a company basis. Therefore, since the invoices are prepared according to this declaration, an individual project's production values cannot be stated in the invoice.
DOE Assessment #2 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	As per the Article 128 (4) of the regulation and confirmed by the PP the electricity generation of an individual project is no longer shown on the final settlement document by PMUM and consequently on the invoices neither. This is due to the fact that EPDK settles the electricity imports and exports from / to the grid on a consumer / company basis rather than on project basis. Against this backdrop CL is closed

Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the next periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements
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Finding	4.1-5
Classification	☐ CAR ☒ CL ☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Section 1.7: the coordinates mentioned seem to be wrong comparing them with the location displayed on the internet presence of Yapisan Elektrik Üretim, http://www.bilgin.com.tr/darica1.asp?ide=darica . Please rectify accordingly.
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The co-ordinates stated on the company website are rough estimations (indicating a random point <i>within</i> the project area). The co-ordinates in Section 1.7 of the MR (sent to the DOE prior to the site visit) also indicate a random point <i>within</i> the project area, <i>not</i> the power/turbine house. The correct power/turbine house's co-ordinates are: 40° 43' 51 N & 37° 51' 30 E, which have been updated in the latest version of the MR (filename: "Darica VCS 2nd verification v2 05 03 2012"). These co-ordinates have been taken from the general layout "as built" of the project (filename: "Darica Power House General Layout Location"), which accompanies this response.
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	Due to the poor resolution of the document the coordinates cannot be identified. Please send the layout with better resolution and mark the coordinates appropriately.
Corrective Action #2 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	In the general layout (as built) the circled (in ink) coordinates of the power plant (i.e. 403 597.4383 & 4 509 531.9758) are stated in UTM (Universal Transverse Mercator) format. These have been converted to Latitude/Longitude (which has been included in the updated MR). Filename: "Darica General Layout & Location of Power House DETAIL" file has been included with this response – it provides higher resolution/detail.
DOE Assessment #2 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The coordinates have been checked via the internet and the layout submitted. The coordinates are correct and the verification team visited this site during the verification. Accordingly it is confirmed that the project is located at the Melet River in the Mesudiye District of Ordu Province (12 km Northeast of Topçam) in the Northern Black Sea region of Turkey. The CL is closed.
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the next periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

Finding	4.1-6
Classification	☐ CAR ☒ CL ☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Considerable differences between the electricity imports as per the meter reading reports and the PMUM monthly reports have been noticed during the desk review. The months of June, September and October are to be mentioned in this respect. The PP is requested to substantiate the validity of the electricity generation figures for the three months using appropriate evidence.
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	PMUM data is based <i>directly</i> on the electricity meter reading reports that are employed for ER calculations. The errors noted (06, 09, & 10/2011) have been rectified on the PMUM website. Scans of the corrected data accompany this response (filename: "PMUM Jun-Sep-Oct 11"). Note that 06 & 09/2011 PMUM data match <i>exactly</i> with the electricity reports, but, for 10/2011 there remains a <i>negligible</i> discrepancy of 0.046 MWh, and the value employed is <i>conservative</i> (i.e. the electricity meter readings).
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The corrected PMUM documents submitted for verification have been checked and its validity is confirmed. The values for the three months are in conformity with the values in the ER-calculation sheet and the Meter Reading Reports. In light of that the correctness of the electricity generation and consumption figures in the MR, sections 4.1 and 4.4 is confirmed.
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the next periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

Finding	4.1-7
Classification	☐ CAR ☐ CL ☒ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	FAR 1: It is recommended to modify the monitoring arrangement of auxiliary diesel consumption as per the methodology "tool to calculate project or leakage CO ₂ emissions from fossil fuel combustion."
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The auxiliary diesel generator's consumption is monitored by volume of fuel consumed so as to comply with the "tool to calculate project or leakage CO ₂ emissions from fossil fuel combustion."
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The Diesel log book maintained on site shows the addition of Diesel to the tank from 19.09.2011 to 26.09.2011. Neither from the records nor from the Diesel invoice it can be confirmed that Diesel has not been consumed prior to 19.09.2011 / later to 26.09.2011. The PP is hence requested to substantiate that Diesel was not consumed prior or later to the dates shown in the log book. The PP should further clarify how data management could be improved in order to ensure that lack of data in future is unlikely.
Corrective Action #2 <i>This section shall be filled by the PP. It shall address the cor-</i>	The diesel generator is only used for back-up in the event of emergencies (i.e. when <i>both</i> turbines are <i>simultaneously</i> off). During the monitoring period in question, the <i>only</i> time this occurred was between

<i>corrective action taken in details.</i>	20/09/2011 and 24/09/2011. This is in line with the diesel purchase documentation and logbook that were shared with the DOE during the site visit (29/02/2012), and can be further checked by referring to the files "Hourly Meter Readings [Dec10-Oct11]" and "Hourly Meter Readings Nov-Dec11" that were given to the DOE at the site. The diesel generator was operated for 109 hours during this monitoring period, and indeed, this corresponds to ca. 4.5 days, which is consistent with the emergency period in question (20-24/09/2011). Going forwards, the PP will keep track of the diesel generator's monthly operating hours, in addition to diesel consumption, so that these may be cross-checked against the emergency operating occurrences.
DOE Assessment #2 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	- From the meter reading reports signed by TEIAS and a representative of YAPISAN ELEKTRIK URETİM A.S. it's apparent that electricity has not been generated only during 20/09/2011 and 24/09/2011 (half day on 20th and 24th). During those 4 days, i.e. approx. 109 hours, power was generated by the Diesel generator. Accordingly, the validity of the running hours is confirmed. - In order to confirm the total consumption the PP is requested to submit adequate evidence for the Diesel consumption per hour. - The appropriateness of the monitoring arrangements should be subject to verification of the third monitoring period.
Corrective Action #3 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The technical specifications of the AKSA-ACQ350 diesel generator accompany this response (filename: "Darica AKSA Diesel genset specs"). Please refer to p.2 of this document for fuel consumption details.
DOE Assessment #3 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The technical data sheet of the generator set submitted by the PP has been checked and the hourly Diesel consumption is identical with the input value of the Diesel consumption calculation spreadsheet submitted for verification. However, the Diesel consumption values calculated amount to 3379 liter, which is not conservative compared to the value applied in the ER-sheet. Thus, the PP is requested to substantiate the calculation with lower values.
Corrective Action #4 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The latest versions of the Monitoring Report (filename: "Darica VCS 2nd verification v4 15 03 2012") and ER spreadsheet (filename: "Darica 2nd Monitoring Period v4 15 03 2012") have been revised for conservativeness related to the diesel generator's consumption during the monitoring period.
DOE Assessment #4 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The revised calculation is checked and accepted. It now reflects the conservative Diesel consumption values and consequently the conservative project emissions. The improvements in the monitoring system w.r.t. data recording is subject to next verification.
Conclusion <i>Tick the appropriate checkbox</i>	☒ To be checked during the next periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

Finding	4.1-8		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Section 1.1 of the MR states an installed capacity of the two generators of 55.16 MW. This is in accordance with the generation license which also states 55.16 MWe. However, as per the nameplate of the generator the rated output is 56000 kVA. The PP is requested to mention also the rated output as well as the active power corresponding to the generators name plate in section 1.1.		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	Section 1.1 of the updated MR (filename: "Darica VCS 2nd verification v2 05 03 2012") has been amended accordingly.		
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	Based on the verification of section 1.1 of the MR the verification team confirms that the rated output / apparent power has been correctly mentioned in line with the generator's nameplate.		
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the next periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements		

Finding	4.1-9		
Classification	☐ CAR	☒ CL	☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	On page 16, 17, 25 and in CL 4 of the verification report of the first monitoring period it is stated that the calibration frequency of the meters is less than 5 years. Solely from the CL 4 it is not traceable why the DOE decided not to accept the 10 years calibration frequency as per article 9 (b) of the "Inspection of Measurement and Measuring Equipments Regulation" published in the Turkish Official Gazette dated 24/07/1994. Please clarify the issue and / or make appropriate adjustments in the MR.		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	Having taken over VCS ER project monitoring and verification duties after the first verification and issuance, this PP is unable to identify why the previous DOE elected the <5 years calibration interval (and why the previous VCS PP consultant accepted this unreasonable request). This PP therefore respectfully requests that TÜV-N accept the 10-year calibration interval which is a <i>Turkish regulation</i> (a copy of which was given to TÜV-N during the 29/02/2012 site visit). Adopting the 10-year standard will align the Project with other Turkish VER projects, and not impose unenforceable responsibilities on TEİAŞ to calibrate the meters more frequently than necessary.		

Finding	4.1-9
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	Though the decision making context during the first verification is not traceable in every detail it's concluded that the calibration frequency is accepted. This is assessed against the backdrop that neither the CDM nor the VCS require PPs to calibrate meters more frequent than officially required by national legislation. Since TEIAS, being the grid operator and electricity buyer has vital interest on the correctness of data it is apparent that TEIAS itself would object this procedure in case this approach would affect their business. Moreover, ELSTER, the manufacturer of the meters confirmed the calibration frequency via E-Mail, too. Taking into account the above mentioned aspects the verification team is convinced that the 10 years calibration frequency is appropriate in the specific project context.
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☐ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

Finding	4.1-10
Classification	☐ CAR ☒ CL ☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Section 3.2: - the calibration dates mentioned reflect the date the calibration reports were printed. These dates are not the same as the calibration dates. Please rectify. - CapPJ is determined on the basis of the installed capacity of the turbines. The corresponding value is irrelevant in this respect. Please rectify the statements.
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	- The calibration dates in the updated MR (filename: "Darica VCS 2nd verification v2 05 03 2012") have been rectified; - CapPJ has been revised such that it is based on generators' rather than turbines' capacity – this is also <i>more conservative</i>.
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	- The calibration dates are now stated in line with the calibration certificates available to the verification team. The authenticity of the calibration certificates – the document is the official form of the manufacturer – is confirmed, too. - The generators' capacity has now been mentioned. However, the PP is requested to ensure that the value is reflecting the installed capacity of the nameplate of the generator.
Corrective Action #2 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The generators' capacity (per their nameplates) have now been included throughout the updated MR (filename: "Darica VCS 2nd verification v3 07 03 2012") which accompanies this response.
DOE Assessment #2 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The installed capacity of the generators is now correctly stated in the MR version 3. The CL is closed

Finding	4.1-10
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

Finding	4.1-11
Classification	☐ CAR ☐ CL ☒ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	It is requested to monitor and record the available water flow for the project for the rest of the crediting period.
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	During the 1st verification period, Topçam Dam (located above the Project), was full. Since the Project was in the construction phase, the Topçam Dam was able to store the water (the project did not use the water throughout the year, and the Dam thus entered the wet season at full volume). As Darica went into commercial operation, the full capacity of Topçam Dam and the nearby rivers was used. During this 2nd monitoring period, water in Topçam Dam was already used by the Project, and the wet season commenced with no water in the dam (i.e. general case predicted for the whole project period). The regular operating practice of Darica HEPP would be to enter the wet season without water, such that water inflows and rain could be stored and used throughout the year (until the next wet season). The first verification period therefore represented an exceptional case, and the production in that period is commensurately higher than the PDD.
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	During on site interviews with the plant manager it has been noticed that the water flow has been recorded by the SCADA system. The consolidated values for the respective months are missing in the MR. The PP is requested to mention the same as per the FAR 2 raised during the first verification.
Corrective Action #2 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The amended MR (filename: "Darica VCS 2nd verification v2 05 03 2012") includes monthly water flow for the monitoring period. Furthermore, relevant SCADA system data were given to the DOE during the site visit (29/02/2012).
DOE Assessment #2 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The value for 12/2010 is not in line with the printout from the SCADA system. Please clarify the difference or adjust accordingly.
Corrective Action #3 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The 12/2010 water flow value has been corrected in the updated MR (filename: "Darica VCS 2nd verification v3 07 03 2012") that accompanies this response.
DOE Assessment #3 <i>The assessment shall encompass all open issues. In case of non-closure, additional</i>	The value in the MR version 3 has been corrected and is now in line with the value as per the SCADA. The FAR is closed.

corrective action and DOE assessments (#2, #3, etc.) shall be added.	
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the next periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

Finding	4.2-12		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	- The COEF in section 3.1 (3,238 kg/tonne fuel) and 4.2 (3.329 t/tonne fuel) is inconsistent. - The PE calculation formula as per the MR section 4.2 has not been used in the ER-calculation sheet. The calculated value is however, entered directly. The PP is requested to apply all formulae in the ER-spreadsheet, too. - Further inconsistent Diesel consumption values are identified in the MR, page 29 (1,423 liter) and in the Diesel consumption spreadsheet (1,419.5 liter). - The unit of $EF_{CO_2,i,y}$ has been wrongly converted from the IPCC values and needs to be corrected accordingly.		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	- Note that in Section 4.2, the value used (and mis-quoted above as 3.329) is 3.239 tCO₂/tfuel. Nonetheless all coefficients throughout the updated project documentation have been corrected and made consistent; - A "Project Emissions" tab has been added to the updated ER spreadsheet (filename: "Darica 2nd Monitoring Period v4 15 03 2012"), and this includes all relevant formulae; - All diesel consumption values in the project documents have been revised for conservativeness (as per FAR 4.1-8 above); & - The appropriate correction has been made in the latest Monitoring Report (filename: "Darica VCS 2nd verification v4 15 03 2012").		
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	- The coefficient is corrected accordingly in version 4 of the MR. Issue of that bullet point is closed. - The updated ER-calculation sheet (version 4) is improved as per the above comment. The issue of that bullet point is closed. - Values in the ER-spreadsheet version 4 and the Diesel consumption spreadsheet which is based on the actual recordings in the log book is corrected. The issue of that bullet point is closed. - The unit is now correctly stated as kg CO₂/ GJ. The issue of that bullet point is closed.		
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the next periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly		

☐ Additional action should be taken ☒ The project complies with the requirements
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Finding	4.1-13
Classification	☐ CAR ☒ CL ☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	The PP is requested to clarify why the meter reading reports do not show the serial numbers of the installed meters. Therefore it is difficult to trace back the meter reading reports to the installed meters.
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	As per the attached screenshot from the official PMUM website (filename: "Darica PMUM electricity meter consolidation CL4.1-15 15 03 2012") the electricity meters' serial numbers can be cross-checked against their assigned reference numbers (that are included in the official electricity meter reading reports).
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	On that basis the verification team confirms that the electricity generation values stated in the MR version 4 can be traced back from the meter reading reports and the PMUM reports to the actual meters installed. It was further confirmed during interviews with the plant manager that the meters were installed continuously. No indication could be detected that the meters were replaced or malfunctioned during the monitoring period. The verification team further observed during the site visit that the meters are physically installed.
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the next periodic verification ☒ Appropriate action was taken ☐ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

Finding	4.2-14
Classification	☐ CAR ☒ CL ☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	- The project title in the MR is inconsistent with the project title in the PDD. Please rectify. - The project number as per the VCS registry is different to the project number as per the MR. Please rectify.
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	- The requested corrections have been made; & - The VCS registry project number has been corrected in the project documentation.
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The project title as well as the project number has been corrected. The MR is now relatable to the PDD and the registry entry.
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the next periodic verification

	☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements
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Final Assessment

An on-site verification visit was carried out. On the basis of this site visit and the reviewed project documentation it can be confirmed that the project activity is implemented in accordance to technology, the project equipments, as well as the monitoring and metering equipment and operated as described in the registered PD.

All necessary monitoring instruments are in operation and found to be in good condition, to be accurate, and reliable. Operating procedures have been implemented as described in the registered PD. The exported electricity to grid and import to the project activity were read jointly and recorded at the beginning of every month. In case of any error or meter malfunction, the reading from the back up meter will be used. There is no error reading for this monitoring period.

Calibration procedures and test reports of all meters covering the reported monitoring period were verified. The calibration frequencies are traceable to industry standards^{/CCI/}. The calibration frequency is not indicated in the certificate but regulated according to Article 9 (b) of the "Inspection of Measurement and Measuring Equipments Regulation", published in Turkish Official Gazette dated 24/07/1994 and No. 22000^{/OTG/TRMC/}. The document indicates a calibration frequency of ten years for the meters which have been used in the project activity for the measuring of the electricity produced. This has been checked during the on-site visit and desk review. The calibration records of all installed meters were checked and found satisfactory. The submitted monitoring report which forms the basis of the verification was prepared by summarizing consolidated monthly data over the whole monitoring period in accordance with the monitoring plan of the registered PD.

The verification team had reviewed the data recorded, calculation sheets and supporting documents. All data were cross checked with the records to confirm the correctness of the recording.

The verification team had further verified the archiving of the data and external documents applied in the emissions reduction calculations.

The verification team confirms the project is operating in accordance to the registered PD. The monitoring plan is implemented as described in the registered PD. There are 2 CARs, 7 CLs and 2 FARs which were raised and closed out.

4.2 Accuracy of GHG Emission Reduction or Removal Calculations

The formulae applied in the calculations of emission reductions are in accordance to the Consolidated baseline methodology for grid connected electricity generation from renewable sources" (ACM0002 version 7). All aspects related to the direct and indirect GHG emissions relevant to the project have been addressed and calculations are presented in a transparent manner.

The baseline and project emissions were calculated appropriately and no leakage is involved. The calculations for the emission reduction of this 2nd verification period are transparently computed and presented in the spread sheet.

Assumptions are correct and appropriate; default values; correction factors are in accordance with Consolidated baseline methodology for grid connected electricity generation from renewable sources" (ACM0002 version 7).

The sources of project specific original data were cross-checked and found to be correct based on the evidences provided by the project proponent. The same is listed in table 6-1 of reference section of this report. The verification team has checked the underlying input values as well as the computation in the spreadsheet. The estimation of the baseline emissions, project emissions was in a transparent and conservative manner.

The ER Excel spreadsheet contains the actual emissions reduction for this 2nd verification. The project has achieved emissions reduction for this reporting period from 1st December 2010 to 31 December 2011 as follows:

Emissions reduction = 182,360 t CO₂e

Related Findings

- ☐ No CARs, CLs or FARs have been identified in this context
- ☒ The following finding(s) have been addressed:

Finding	4.2-1		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Section 4.1: The VCS guidelines state that this section should clearly provide the baseline emissions. Various information have been presented regarding the Operating and Build Margins but not the actual baseline emissions. Table 8 presents the Emissions Reductions which is not required in this section. The PP is requested to correct the section and to state only information relevant in the monitoring period.		
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	Section 4.1 (including Table 8) has been amended to include baseline emission reductions per VCS guidelines.		
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The terminology, baseline emission reductions, is not correct. Please distinguish between BE and ER.		
Corrective Action #2 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The appropriate corrections have been made throughout the updated MR (filename: "Darica VCS 2nd verification v3 07 03 2012") that accompanies this response.		
DOE Assessment #2 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The corrections are incorporated and deemed adequate. The CAR is closed.		
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the next periodic verification ☒ Appropriate action was taken		

	☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements
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Finding	4.2-2
Classification	☒ CAR ☐ CL ☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Section 4.4 The Emissions reductions are calculated using the baseline emissions, leakage emissions and project emissions. The terminology used in this section should be corrected to reflect this.
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The appropriate corrections to Section 4.4. have been made in the amended MR (filename: "Darica VCS 2nd verification v2 05 03 2012").
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The terminology, baseline emission reductions, is not correct. Please distinguish between BE and ER.
Corrective Action #2 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The appropriate corrections have been made throughout the updated MR (filename: "Darica VCS 2nd verification v3 07 03 2012") that accompanies this response.
DOE Assessment #2 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The corrections are incorporated and deemed adequate. The CAR is closed.
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the next periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

Finding	4.2-3
Classification	☒ CAR ☐ CL ☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>	Excel Spreadsheet: The spreadsheet contains a tab called "Saydfa1" in which the emissions reductions are presented for the entire monitoring period on a monthly basis. According to tab, the total is 179,397 tCO ₂ e. However, this differs from the value presented in the tab called "Emissions Reductions". Please explain this.
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>	The "Sayfa1" tab had not included 12/2011, explaining the discrepancy. The amended spreadsheet (filename: "Darica 2nd Monitoring Period v2 05 03 2012") has been corrected, and the "Sayfa1" tab has been named

	"Emission Reductions".
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>	The revised ER-calculation spreadsheet has been checked. In line with the response to the finding the value of December 2011 has been added. The ER-calculation has been completed using the correct values of BE from the meter reading reports and the values of PE from Diesel consumption records. With respect to the validity of Diesel consumption records / corresponding means of cross check please refer to FAR 4.1-8
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the next periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

Final Assessment

Three CARs have been raised as shown above and discussed during the site visit.

The verification team had reviewed the data collected and archived for the determination of the baseline emissions and any project emissions during the monitoring period claiming the emission reductions. All data applied in the calculations have been cross checked to conclude the emission reductions are calculated correctly.

Calibration of meters, instruments and equipment used in the recording of data are verified by reviewing the records to confirm calibration are carried out on or before the expiry date of the certificates. For this period, there are no lapses in the calibration for any of the instruments.

The electricity export meters to the grid were verified and calibrated once every 10 years by the third party who is authorized from the national grid. A copy of Article 9 (b) of the "Inspection of Measurement and Measuring Equipments Regulation", published in Turkish Official Gazette dated 24/07/1994 and No. 22000 has been checked in the course of verification to confirm the validity of the calibration frequency.

The excel sheets were thoroughly validated with the archived data. All CARs raised as above described errors identified during the verification and were closed out. The data applied in the calculations are consistent with the relevant raw data records.

4.3 Quality of Evidence to Determine GHG Emission Reductions or Removals (change necessary)

During the on-site visit, the verification team has reviewed and verified the respective documents that were used to determine the emission reductions. The records were traceable to reference data or a parameter. The verification team had reviewed the data to check on the evidence in support of the emission reductions. All meter reading reports^{/MRR/} reviewed were signed by the responsible person of the project activity as well as a representative of TEIAS. The documents are archived and stored in the server at the hydropower plant and externally at the head office in Ankara^{/IMO1/}. All data for the monitoring period are stored for the whole crediting period and additional 2 years after expiry. Details of the documents are listed in Table 6-1 of the verification report, and the ER calculations were appropriately and satisfactorily corrected by the PP. All the formulae have been found to be correctly applied in the emission reduction calculations. No factual error including manual or electronic mistakes has been found. Thus it is confirmed that the ER calculations are overall correct.

Related Findings

☒ No CARs, CLs or FARs have been identified in this context

☐ The following finding(s) have been addressed:

Quality of Evidence	4.3-1		
Classification	☐ CAR	☐ CL	☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>			
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>			
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>			
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the first periodic verification ☐ Appropriate action was taken ☐ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements		

Final Assessment

The verification team had reviewed the data collected and archived for the determination of the baseline emissions and any project emissions for the crediting period.

The documents developed to monitor and determine the emission reductions were easily traceable and referenced. The archiving and storage of data and hard copies are in secured locations. Thus it is confirmed that the Quality of Evidence to Determine GHG Emission Reductions is reliable.

4.4 Management and Operational System

The allocation of responsibilities is documented in a written form and followed as described in the MR. This has been verified during the onsite visit^{/IM01/}. Routines for the archiving of data are defined and documented. Formulae applied in the calculations are in line with methodology and registered PDD.

The monitoring personnel at site are well trained and follow the daily routines established. This was evident during interviews with the plant manager. Procedure for training and maintenance of critical equipments are established as apparent from the monitoring manual^{/MM/}. Day to day operation is supervised by the technically qualified site engineers to ensure round the clock operation and maintain the project activity^{/IM01/}.

Training is provided to the respective personnel when required. The plant operators are trained by the technology provider on the operation of the hydropower plant.

All necessary recorded raw data were checked and confirmed during on-site visit. The personnel in charge of each shift are responsible for recording the total electricity generation, electricity export, electricity import, plant shut down times, down time, etc.^{/IM01/}.

The daily data is aggregated and monthly reports are generated. These reports are submitted to the Plant Manager for review and signed off. The raw data was reviewed for correctness and any corrective measures initiated in case of minor errors in the monitored data.

Related Findings

- ☒ No CARs, CLs or FARs have been identified in this context
- ☐ The following finding(s) have been addressed

Management and Operational System	4.4-1		
Classification	☐ CAR	☐ CL	☐ FAR
Description of finding <i>Describe the finding in unambiguous style; address the context (e.g. section)</i>			
Corrective Action #1 <i>This section shall be filled by the PP. It shall address the corrective action taken in details.</i>			
DOE Assessment #1 <i>The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</i>			
Conclusion <i>Tick the appropriate checkbox</i>	☐ To be checked during the next periodic verification ☐ Appropriate action was taken ☐ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements		

Final Assessment

CDM monitoring procedure and documentations were developed, maintained and controlled to meet the standard requirements. The project activity documentation system is under supervision of the plant manager.

It could be evidenced that the monitoring system ensures tracking of generation on a continuous basis; the generation itself was carried out as a continuous (except for some planned breakdowns or outage) operation.

The energy readings from the main meters are jointly read by power company authorized personnel (TEIAS) and the PP. The main meter is sealed and can only be accessed by the local grid officials^{/IM01/}.

The plant is adhering to calibrating the meters once every 10 years. Calibration reports for the monitoring period have been submitted and verified and found to be acceptable.

From the site visit and interviews conducted, it was clear that the roles and responsibilities of the team tasked with monitoring of emission reductions are well defined. The shift-in-charge records generation on a daily basis, as also keeps track of and records monthly generation and downtime details. From the interviews, it is also clear that the personnel involved in project activity are competent to carry out their respective duties.

All monitored data are archived in physical and electronic form. The data were kept for the whole crediting period and additional 2 years as given in the PD.

5 Verification conclusion

EcoSecurities International Limited has commissioned TÜV NORD JI/CDM Certification Program to carry out the verification of the Project *DARICA-1 99 MW Hydro Power Plant* with regard to the requirements of VCS Version 3.2 Standard.

The project involves the installation of a 99 MW hydropower project. The purpose of the project activity is the generation of electricity which is supplied to the Turkish electricity grid. The project construction commenced in April 2007, and the first turbine began operating on 10/10/2009. On 23/12/2009, the second turbine began operating, and the Project has been operational since. The project consists of 2 turbines each of which have a capacity of 56.21 MW and two synchronous generators with a total rated output of 112 MVA.

Reporting period: From 01 December 2010 to 31st December 2011 (both days inclusive)

The verification is based on the monitoring report, the monitoring plan as set out in the validated PD, the emission reduction calculation spreadsheet and supporting documents made available to the TÜV NORD JI/CDM CP by the project participant

In detail the conclusions can be summarized as follows:

- all operations of the project are implemented and installed as planned and described in the registered PD version 04/18.
- the monitoring plan is in accordance with the applied approved methodology i.e, Consolidated baseline methodology for grid connected electricity generation from renewable sources" (ACM0002 version 7)
- the installed equipment essential for measuring parameters required for calculating emission reductions are calibrated appropriately and according to the frequency as stated in the monitoring plan of the registered PD version 04/18.
- the monitoring system is in place and functional. The project has generated GHG emission reductions.

In the course of the verification, 5 Corrective Action Requests (CARs) and 7 Clarification Requests (CLs) and 1 Forward Action Requests (FAR) were raised and closed. FAR 4.1-7 will be checked during the next verification.

As the result of this 2nd periodic verification, the verifier confirms that the GHG emission reductions are calculated without material misstatements and in a conservative and appropriate manner. TÜV NORD JI/CDM CP herewith confirms that the project has achieved emission reductions in the above mentioned reporting period as follows:

Reporting period: From 01 December 2010 to 31 December 2010

Verified GHG emission reductions or removals:

GHG Emission Reductions or Removals	tCO ₂ e
Baseline Emissions	182,370
Project Emissions	10
Leakage	0
Net GHG emission reductions or removals	182,360

Alexander Richter, 2012-03-15



TÜV NORD JI/CDM Certification Program
Verification Team Leader

Ingo Klein, 2012-03-15



TÜV NORD JI/CDM Certification Program
Final Approval

6. References

Table 6-1: Documents provided by the project participant

Reference	Document
/CCI/	Electricity Meters Calibration Certificates from Elster: <u>Main Meter Serial No. 361509</u> 1) Order no. 53256402, calibration date 06.02.2008 <u>Back Up Meter Serial No. 361510</u> 1) Order no. 53256402, calibration date 06.02.2008 <u>Main Meter Serial No. 364713</u> 2) Order no. 54810002, calibration date 02.04.2008 <u>Back Up Meter Serial No. 364714</u> 2) Order no. 54810002, calibration date 02.04.2008
/DII/	Diesel Invoice, dated 19.09.2011
/DCL/	Log Book for Diesel Consumption
/DCC/	Diesel Consumption Calculation Spreadsheet
/EGL/	Electricity Generation License, dated 22 June 2006, valid for 49 years
/EM/	Email from ELSTER (Electricity meter manufacturer)
/ERC/	ER Calculation sheets Darica 2 nd Monitoring Period from 01 December 2010 to 31 December 2011 (including both dates) 1) Version 1, dated 2012-02-20 2) Version 2, dated 2012-03-05 3) Version 3, dated 2012-03-07
/FIP/	First index protocols of meter installation, dated 2009-10-10 and 2009-12-23
/LB/	Down Time Log Book during monitoring 01 December 2010 to 31 December 2011
/MES/	Main Equipment Specification • Technical Data Sheet & Nameplate of the Diesel Generator Set • Nameplate of the Synchronous Generator • Technical Data Sheet of the Francis Turbine
/MM/	VCS Darica HPP Monitoring Manual for DARICA-1 99 MW Hydro Power Plant, dated 24.12.2010 version 2
/MRLB/	Meter Reading Logbook maintained on site
/MRR/	Electricity Meter Reading Reports (Export and Import Reading) from December 2010 to December 2011

Reference	Document
/IOC/	Organization Chart of DARICA-1 99 MW Hydro Power Plant
/OTG/	Official Gazette of Turkey dated 24/07/1994 and No. 22000
/PDI/	VCS Project Description: DARICA-1 99 MW Hydro Power Plant version 4, dated 18 th April 2009
/PHOTO/	Photographs of key equipment and nameplates etc.
/PLI/	DARICA-1 99MW Hydropower Project Activity Layout (undated)
/PMUM/	Daily and Monthly Electricity Data Reading from PMUM Extracted from official PMUM website and generated by the remote meter recording during the monitoring period 01 December 2010 to 31 December 2011
/REIA/	Relieve from the Environmental Impact Assessment, dated 27 July 2007
/REMBS/	Regulation of Electricity Market Balancing and Settlement published, dated 14/04/2009 www.epdk.gov.tr/web/elektrik-piyasasi-dairesi/26
/SCADA/	SCADA System for controlling and monitoring of the plant using relevant data
/SLDI/	DARICA-1 99MW Hydropower Project Single Line Diagram including the Metering Layout
/TRMC/	Turkish regulation regarding electricity meter calibration interval
/ValR/	Validation Report SGS, DARICA-1 99 MW Hydro Power Plant dated 06 May 2009, UK AR6 VCS2007 Validation Report
/VerR/	Verification Report RINA, DARICA-1 99 MW Hydro Power Plant, Monitoring period: 10/10/2009 to 30/11/2010, Report No. 2010 DG 11 MD, Revision No. 1.2, dated 2011-10-20
/WFD/	Monthly water flow data, derived from the SCADA system

Table 6-2: Background investigation and assessment documents

Reference	Document
/ACM0002/	Consolidated baseline methodology for grid-connected electricity generation from renewable sources, version 7
/CPM/	TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms)

Reference	Document
/IPCC/	2006 IPCC Guidelines for National Greenhouse Gas Inventories: General Guidance and Reporting
/ISO 14064/	Greenhouse gases -- Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals Greenhouse gases -- Part 2: Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emission reductions or removal enhancements Greenhouse gases -- Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions
/ISO14065/	Greenhouse gases -- Requirements for greenhouse gas validation and verification bodies for use in accreditation or other forms of recognition
/PDD/	Registered PD of DARICA-1 99 MW Hydro Power Plant dated 18.04.2009
/TEF/	Tool to calculate the emission factor for an electricity system (version 2)
/VCS/	Voluntary Carbon Standard, Version 3.2
/VCS-PD-T/	VCS PD Template version 3
/VCS-MR-T/	VCS MR Template version 3
/VPA/	VCS Policy Announcement "Further Guidance for Projects that are Registered in Two GHG Programs"
/VRT/	VCS Verification Report Template
/VVS/	Validation and Verification Standard (Version 2)

Table 6-3: Websites used

Reference	Link	Organisation
/cd4cdm/	www.cd4cdm.org	UNEP Riso Centre
/ipcc/	www.ipcc-nggip.iges.or.jp	IPCC publications
/vcs/	www.v-c-s.org	VCSA
/unfccc/	http://cdm.unfccc.int	UNFCCC

Table 6-4: List of interviewed persons

Reference	Moi ¹		Name	Organisation / Function
/IM01/		☒ Mr. ☐ Ms	Mr. Osman Fırat Alkan	Plant Manager Yapısan Elektrik Üretim Anonim Şirketi
	V	☐ Mr. ☒ Ms	Ms. Burcu Kılıç	Project Carbon Manager Yapısan Elektrik Üretim Anonim Şirketi
/IM02/	V	☒ Mr. ☐ Ms	Mr. Amin Bekai	Senior Project Manager EcoSecurities International Limited

¹⁾ Means of Interview: (Telephone, E-Mail, Visit)