

<p>COUNTRY: MOROCCO</p> 	<p>SOLAR POWERED IRRIGATION SYSTEMS – COUNTRY CASE STUDY ALAOUI</p>
	<p>Geographical Location:</p> <ul style="list-style-type: none"> ▪ Rabat ▪ Latitude: 33°47'28" N ▪ Longitude: 6°50'30" W ▪ Altitude: 46 m
	<p>Specific Site Conditions:</p> <ul style="list-style-type: none"> ▪ Climatic condition: semi-arid ▪ Irrigation water is provided by a deep-well and pumped into an open reservoir ▪ Farm established in 2005, is connected to public grid but due to high cost of electricity, electric pumps have been replaced by PV pumps ▪ Water quality is good; well also used for drinking water supply ▪ Shallow and stable water level - no seasonal shortage of water
	<p>Salient Features of Solar-powered Irrigation System:</p> <ul style="list-style-type: none"> ▪ 2 x 14,7 kW_p PV generator ▪ Combination of submersible pump installed in a deep-well and a surface pump pumping the irrigation water from an open reservoir directly into the drip irrigation system ▪ Conventional electrical pump still installed in as back-up ▪ Daily mean water output: 450 m³/day ▪ Pumping Head: 30 m ▪ Drip irrigation system in place (in total 34,000 drippers), 1/2" high quality drip tube with mounted pressure compensated diaphragm emitters (discharge 0.2 – 0.3 gph) ▪ System includes large capacity filter installation and fertigation unit (2 nutrient solution injection tanks)
	<p>System Costs / Financing:</p> <ul style="list-style-type: none"> ▪ PV system: 39,450 EUR ▪ Irrigation system: 72,650 EUR ▪ Farm pond: approx. 200,000 EUR ▪ System privately financed without any subsidies
	<p>Farming System / Cropping Patterns:</p> <ul style="list-style-type: none"> ▪ Industrial horticultural farming ▪ Main product: Table grape – 580 – 620 t/year and ha ▪ Grape-vine age: 5 - 9 years ▪ Farm size 35 ha, 24 ha under irrigation ▪ Irrigation from March to end of September ▪ Total water demand = 30,000 t per year ▪ Crop rotation: perennial vineyard, rotation 12 – 16 yeas ▪ High intensity crop input management ▪ Grapes are sold via auction and harvested by external workers (mostly women) hired by customers <p>Experiences / Lessons Learnt:</p> <ul style="list-style-type: none"> ▪ PV installation is oversized ▪ Electricity bill used to be about 890 EUR per month – after PV installation, no electricity expenditure anymore ▪ SPIS is economically competitive with grid-electricity ▪ Not more than two workers required to manage the farm <p>Promoting and Planning Bodies:</p> <ul style="list-style-type: none"> ▪ Private investor development project ▪ System integrator: AE Photonics, Morocco