

## Hand out: Occupations in the Renewable Energy Sector

Source: ILO. 2011. Skills and occupational needs in renewable energy (ILO, Geneva)

	<i>Wind</i>	<i>Solar (PV, ST, CSP, PS)</i>	<i>Hydropower</i>	<i>Geothermal</i>	<i>Bioenergy</i>
<b>Equipment Manufacture (incl. design)</b>	R&D Engineers (computer, electrical, environmental, mechanical, wind power design) (H) Industrial mechanics (M)	Researcher (Chemists Physicists, Engineers with specialization in electrical, mechanical, chemical, materials, system design or process engineering) (H) Chemical laboratory technicians and assistants (M) Production technicians and technologists (M) Manufacturing Specialists (H,M) Building Systems Specialists (H) Manufacturing Quality Assurance Experts (H,M) Manufacturing Specialists (H,M)	Design Engineers (Civil, Mechanical, Electrical, Hydropower) (H)	Designers (H) Electrical engineers (H) Mechanical engineers (H) Software developers (H) Sales personnel (M) Welder (M) Machinists (M)	Biochemists and Microbiologists (H) Chemical, Biological, Mechanical & Electrical Engineers (H) Software Engineers (H) Manufacturing Quality Assurance Specialists (H,M) Manufacturing Specialists (H,M)
<b>Construction and Installation</b>	Wind resource assessment specialist (H) Environmental impact assessment specialist (H,M) Project designer (Engineer) (H) Project developers and project managers (H) Geographers (H) Electrical, civil and marine engineers (H) Construction electrician (M) Constructioner (M) Power line technician (M) Quality control inspectors (M) Instrumentation & control technicians (M) Small wind turbines installers (M)	<b>Passive Solar</b> Architects (H) <b>Solar Thermal</b> System designer (H,M) Plumbers Specialising in Solar (M) <b>Small PV</b> System designer (Electrical engineers or technologists) (H,M) Electricians specializing in Solar(M) <b>Small Scale PV, Solar Thermal</b> Roofers Specialising in Solar (M) <b>Large Photovoltaic</b> System Designer (Electrical / Mechanical / Structural Engineer) Installers (M) <b>SPV, LPV, ST, CSP</b> Electricians specializing in Solar (M) <b>SPV, LPV, ST, SCP,PS</b> Project Designers & Managers (H)	Archaeologists (H) Ecologists and Geologists (H) Design Engineers (Civil, Mechanical, Electrical) (H) Environmental Engineers (H) Natural Resource / Environmental Lawyers (H) Natural Resource / Environmental Planners (H) Social Scientists /cultural consultants (H) Construction Technicians (Heavy Machinery Operators, Welders, Pipe-fitters etc.), (M)	Managers (H) Geologists (H) Geophysicists (H) Engineers (H) Geochemists (H) Chemical laboratory technicians and assistants (M)  Hydrologists, Hydrogeologists (H) Drilling engineers (H) Architects (H) Structural engineers Surveyors (H) Designers (H) HVAC technicians (H) Measurement and control engineers (H) Drilling Technicians and Operatives (Roughnecks) (M)	Biochemists and Microbiologists (H) Chemical laboratory technicians and assistants (M) Chemical, Biological, Mechanical & Electrical Engineers (H) Construction Professionals (H) Environmental Engineers (H) Project Designers & Managers (H) Software Engineers (H) General Electricians, Plumbers, Roofers (M) General Construction Workers (L)

	<i>Wind</i>	<i>Solar (PV, ST, CSP, PS)</i>	<i>Hydropower</i>	<i>Geothermal</i>	<i>Bioenergy</i>
		Resource Assessment Specialists (H) Site, Project and Installation Evaluators (H,M) Construction Professionals (H) Installers (M) Sales Reps Trained in Solar (H,M)		Welder (M) Pipe fitters (M) Plumbers (M) Construction equipment operator (M) Drilling equipment operator (M) Excavators (L)	
<b>Fuel Production (excluding electricity and hydrogen)</b>					Agricultural Scientists (H) Biomass Production Managers (H,M) Plant Breeders & Foresters (H,M) Resource Assessment Specialists (H)
<b>Operation and Maintenance</b>	Windsmith / Millwright / Mechanical Technician or Fitter (H,M) Operations and maintenance specialists (M) Power line technician (M) Wind service mechatronics (M) Field electricians (M)	Maintenance workers (L) PV Maintenance specialists (Electricians specialising in Solar) (M) ST Maintenance specialists (Plumbers Specialising in Solar) (M) CSP and PS maintenance specialists Inspectors (M,L)	Design Engineers (Civil, Mechanical, Electrical) (H) Operations & Maintenance technicians (M)	Plant managers (H) Measurement and control engineers (H) Welder (M) Pipe Fitters (M) Plumbers (M) Machinists (M) Electricians (M) Construction equipment operator (M) HVAC technicians (M)	Biochemists and Microbiologists (H) Operation & Maintenance Workers (M,L) Society & Trade Administrators (H,M)
<b>Cross-cutting / Enabling Activities</b>	Government Office Workers (H,M) Policy makers (H) Educators & Trainers (H) Atmospheric scientists and Technical sales specialists (technologists with training in sales) (M)	Government Office Workers (H,M) Educators & Trainers (H) Atmospheric scientists and meteorologists (H) Technical sales specialists (engineers or technologists with training in sales) (H,M)	Government Office Workers (H,M) Educators & Trainers (H)	Government Office Workers (H,M) Educators & Trainers (H)	Government Office Workers (H,M) Educators & Trainers (H)

***Cross-Sectoral occupations***

<b>Equipment Manufacture (incl. design)</b>	General Assemblers (L) Assembly Line Workers and Manufacturing Process Operators (L) Sales and Marketing Professionals (H,M) Manufacturing Logistics Operators (L) Quality and Control specialists (M)
<b>Construction and Installation</b>	Debt Financier Representatives (H) Business Developers (H) Caterers (L) Transportation Workers (L) Sales and Marketing Professionals (H,M) Smart grid electrician (M) Automation and control technicians (M)
<b>Fuel Production (excluding electricity and hydrogen)</b>	Transportation Workers (L)
<b>Operation and Maintenance</b>	Other Maintenance Workers (M,L)
<b>Cross-cutting / Enabling Activities</b>	Policymakers (H) Material scientist in R&D (H) Environmental engineer / consultant (H) Commissioning Engineer (Electrical) (H) Health and Safety consultant (H,M) Land development advisor (H) Commercial Lawyers (H) - Environmental legal consultant Public Relations Officer (H) Other Financial Professionals (Accountants, Auditors and Financers) (H) Government professionals Human Resources Professionals (H) IT Professionals (H,M) Administrators (H,M) Office Managers (H,M) Environmental and Social NGO Reps (H,M) Insurer Representatives (H,M) Publishers (H) Science writers (H) Society and Trade Association Leads and Staff (H,M, L) Lobbyist (H) Mediator (H) Land use negotiator (H)

H = High skilled – Professional / managerial; M = Medium skilled – Technician / Skilled Manual / Supervisory; L = Low – Semi-skilled PV: Photovoltaic, SPV: Small-scale PV, LPV: Large-scale PV, ST: Solar Thermal, CSP: Concentrating Solar, PS: Passive Solar