Interview With Miroslav Dolejsi,Vice General Manager of SolEngCo GmbH

About The Author

Summer Yang, a senior journalist with CSPPLAZA-(the only media in China, exclusively providing CSP information worldwide), having a good knowledge regarding CSP industry and a rich experience in interviewing many giants in CSP field.

The global CSP industry has gone through 30 years of ups and downs and changes ever since the United States built the first commercial CSP project in 1980s. During the 30 years, the CSP industry has built almost 5GW of installed capacity; and during the 30 years, the territory of global CSP market transferred from the traditional markets to the emerging markets. But those who for a long time, keep chasing the CSP dream, whatever the environment changes, still remain the same.

Miroslav Dolejsi, the deputy general manager of German CSP engineering consulting firm SolEngCo, is such a dream chaser, and of course he is a senior expert of the CSP industry. On China International CSP Station Conference & CSPPLAZA 2015 Annual Meeting held in June 25th-26th in Beijing, China, the audiences listened to Miroslav Dolejsi sharing his experience of participates in Spanish classic trough CSP projects. And in order to further learn more of his opinion of the industry, the journalist of CSPPLAZA interviewed Miroslav Dolejsi during the conference in 26th, June.

photo: Miroslav Dolejsi gave a speech on CSPPLAZA Annual Meeting 2015

Q:Over the past few years, CSP market has moved from traditional marketplaces like Spain and the US to emerging marketplaces like Middle East and Africa. How do you think of this change?

A:It is true that activity fell in Spain and US due to policy and regulation changes and therefore developers are focusing on emerging markets such as Morocco, Kuwait, the UAE, Saudi Arabia, South Africa and Chile. I understand the utilities in the USA that the US`s grids can accommodate a large amount of renewable undispatchable power from PV and Wind, which is much cheaper today than power from CSP with TES and therefore CSP technologies cannot compete on price until the grid will get on its technical limits with undispatchable power or until the energy policy framework in the United States undergoes next changes.

However the emerging markets offers Energy Technology Perspectives by which policy and technology together become driving forces in transforming the energy sector over the next years. They have also reinforced the central role of policy in the increasingly urgent need to meet growing energy demand while addressing related concerns for energy security, costs and energy-related environmental impacts.

In such environment CSP technologies with TES have their place and I hope that the countries legislation and support from the governments for future deployment of CSP will take place. Because financing institutions acknowledge CSP advantages in terms of storage capacity and dispatch profile the emerging markets have a great opportunity to attract international developers.

I think that the participation of multilateral banks will continue to be a key factor in the growth of CSP in emerging markets. However their presence can stimulate the participation of commercial local banks, which is attractive for governments and country policy.

Moreover construction of CSP Projects require more local manpower than construction of any other power plant therefore I think that CSP markets are also strongly promoting local content in their projects and know-how transfer.

Also some manufactures are intending to follow customers' needs and open up manufacturing plants in customer's countries, which helps positively to the social economic environment in customer's countries.

I think that emerging marketplaces entrants are helping to drive down costs of CSP plants. As we can witness in projects like Noor II and Noor III and it also opening door for new payers in CSP Business.

Recent technology developments, markets and energy-related events have asserted their capacity to influence global energy systems, therefore I think that innovation of CSP technologies and components is necessary and can be carried on only if the plants are built and operated.

I would like to mention here that besides Middle East and Africa also other potential markets are uprising like in China, India, Greek, Cyprus, South of Africa and South America.

Q:How do you anticipate global CSP market outlook? It is expected by IEA that CSP electricity will take up 11% of global power by 2015 2050, how do you think of this expectation? It is shown on your web Vision that your goal is to meet 100million people's

power need by 2025. This is an ambitious mission, which equals to a 40GW CSP capacity. But now 2015, global CSP capacity is 5GW less. So can we say that there will be a 8 times growth rate in the next 10 years?

A:It is true that the IEA`s roadmap seems to be delayed, however IEA expectations for STE's share of global electricity to reach 11% by 2050 is almost unchanged from the goal in the 2010 roadmap.

CSP plants development had grown strongly worldwide since 2005 to 2010 and then PV and Wind took the lead. From a system perspective, CSP offers significant advantages over PV and Wind, mostly because of its built-in thermal storage capabilities and therefore CSP will keep playing a role in renewable power generation worldwide and this is in which SolEngCo believes. Our vision of 100 TWh/a generation is approximately 0.5% of world electricity generation, which we estimated in 2012,before we established SolEngCo. We all know that many countries have in their Energy Policies Plants including power generation from CSP. For example Kuwait plans to have renewable sources supplying 10% of its energy needs by 2020, Morocco planning 2 GW of solar energy by 2020, South Africa has plans for 1,200 MW of CSP by 2030 and Kingdom of Saudi Arabian announced 25 GW of CSP by 2032.

We know that our vision is ambitious but ambitious goals make outstanding achievements and we are aiming to make the world a better place and to reduce the negative impact of emissions and waste on our health and environment through our vision, drive, motivation, knowledge and hard work.

And we appreciate that we will have more companions to push forwards the CSP Technology and to achieve our vision. The key for the outlook is the target of reducing the cost of CSP systems which is clearly a significant challenge; however, pursuing these aggressive goals will enable considerable advancements in CSP technology to make CSP technologies competitive with fossil fuels through both technology activities (e.g. R&D, studies, testing etc.) and non-technology activities (e.g. manufacturing, transmission, land, permitting, financing etc.).

Q:At present, trough is the main commercial application of CSP technology, while molten salt tower application is in accelerating development. It is said that molten salt tower has the greatest potential of cost reduction. How do you think of this view?

A:I think that the concept of Solar Power Tower with molten salt as HTF has the highest potential of cost reduction in compare to other commercially proved CSP technologies. However, Solar Power Towers perform better on places with high DNI and clear air mass like in South Africa, Chile, USA, etc.. Nevertheless in places with lower DNI and pollution in ground air the trough technology reminds a strong competitor.

I think that the SunShot Initiative goal of 6¢/kWh with no ITC by 2020 is also very ambitious. The R&D needs operational experience, which is in the CSP business still very rare.

Q:CSP cost is gradually declining, but compared with wind power and PV,CSP cost is still too high. What do you have in mind to help reduce CSP cost?

A:I think of reducing investment costs, O&M costs and improving performance. In case of improving performance I have in mind to find the most suitable site, suitable shape (e.g. for parabolic trough a square solar field shape, with the power block in the middle), increase in

capacity factor and mainly to build larger plant sizes (e.g. for parabolic trough technologies for more than 100 MWe power output with 7+ h TES). It is also necessary to follow the technology advancements through R&D (e.g. a reduction in storage-material mass and the associated reduction in costs that will make it possible to economically add higher TES capacities. Longer-duration storage (e.g. 12 hours) would make near-baseload operation possible. Or for Solar Power Tower a R&D in High Temperature Receivers employing Supercritical Steam Cycles or Supercritical CO2, or mirror washing technologies etc.)

In case of reducing capital cost I have in mind manufacturing costs and installation costs. The key to reducing solar field costs is reducing the cost of the reflectors support structure, reflectors, receivers and assembly costs at the site.

I see the main cost-reduction potential in the current Power Block Island correlated to increased size of the Solar Island. For multiple CSP Plants can be shared infrastructure, such as roads, substations, buildings, O&M staffing, assembly hall (s) etc. In case of reducing O&M costs I have in mind potential areas for automation –"performance maintenance". And of course increase the capacity factor and design larger plant sizes.

Q:You and Georg Brakmann might be called as the father of ISCC technology. You successfully drove the development of the first batch ISCC plant. But up to now, ISCC plants are not expanded worldwide. What are the main reasons?

A:It is true that only 5 ISCC Projects with parabolic troughs are in operation, 1 under construction, 2 on hold and 3 ISCC Projects in development phase. I think of 3 main reasons, why ISCC Projects are not attractive for developers.

- The first reason is that the Utilities consider the levelized cost of electricity (LCOE) for ISCC same like for CCGT that means 4 to 6 c/KWh, which these days is not possible to archive with CSP technology.

- The second reason is that all ISCC Projects are designed with an integration of CSP Solar Filed without TES, which makes this technology same to CSP stay-alone-plant without TES. That means such technology is not economically attractive for developers and lenders.

- The third reason is that the solar share shall be between 20 to 25% of the designed power output as Georg Brakmann proved thermodynamically in front of World Bank and KfW. Unfortunately none of the above mentioned ISCC Plants meets this requirement, except the Abdaliya Integrated Solar Combined Cycle Project in Kuwait.

I strongly believe in a comeback of this kind of technology. I would be very pleased if SolEngCo could assist to Utilities and Developers to develop a technical-economic optimum ISCC Projects.

Q:How do you think of the CSP market outlook in China? You know that the climate in western China, with extremely cold, strong windstorm. How do you think of the effect of such environment on plant development, and plant operation and maintenance? What about the solution to better adapt to such natural conditions for CSP project?

A:We consider Gansu, Inner Mongolia, Qinghai, Xizang and Xinjiang having a good solar resource for CSP development but all of them are far from end power users and are poor on

infrastructure. Some of these places are suffering on weaknesses like extreme weather conditions, sand storms, lack of water and long distance from existing grids. Therefore we think that the site selection shall be carried on considering those weaknesses that will be very important for the design of the facility.

CSP Plants are originally designed for desert conditions and therefore not much changes in original design are necessary. The risk mitigation of extreme weather or sand storms can be ensure by designing a reinforcement of equipment, protection mechanism to avoid damages in equipment and increase the requirements for materials and equipment due specific site conditions.

We see a bigger problem in poor infrastructure which needs additional costs for creating the necessary transport infrastructures, water reserves (underground and surface) and specific drainages to ensure the supply for these plants.

Another way, to archive the CSP development in China faster, would be to promote hybridization like combined cycles or/and coal-solar power plants.

Q: Currently, CSP in China is in a trap of Chicken and Egg. That is to say the government need the industries to build CSP plants, and observe the operation effect, thus to accordingly release relevant policies, while the industries hope to get policies and price for electricity from the government and then launch projects. How do you see such trap, and how about the access of stepping out of such trap? What are your suggestions?

A:In 2009, the Chinese government identified PV cells manufacturing as a strategic industry. A strong support to domestic PV manufacturing sector coupled with fortuitous global developments for the industry have enabled Chinese firms to dominate the global market. It has helped to reduce the cost of solar PV power leading to its growing deployment. PV solar power is not competitive to conventional sources for base load like coal, but CSP could be a competitive to them if the LOEC and the TES capacity allowed a similar LOEC and load profile.

CSP development in China seems to be very promising, due to its manufacturing and development capabilities, as shown in wind or PV. I believe that Chinese entrepreneurs could lead to a decrease on investment costs and hence on the cost of the energy produced. If China handles the CSP like it handled PV then it is to be expected that Chinese firms have a big change also to dominate the global CSP market. It will be interesting to observe the trajectory global costs of solar power generation follow in the light of economic recovery and accelerated deployment around the world.

Unfortunately there is still a capacity gap in some key technical and financial institutions in China probably because CSP is a new technology. We are suggesting to such institutions to hire technical and legal consultants from abroad to provide knowledge, experience, and independent ideas to them.

Q: What specific service items can SolEngCo provide to CSP project development in China? In the process of expanding market in China, what problems did you encounter?

A: We can provide technical consultancy services to authorities, utilities, developers and EPC contractors. SolEngCo provides the complete range of engineering services, including master plans, techno-economic feasibility studies, site selection studies, conceptual design, financing,

permitting, contractual and technical specifications, tendering and evaluation of EPC contracts and their negotiations until “EPC-contracts ready to be signed”, supervision and owner’s engineering services during engineering, procurement, construction, commissioning, warranty, operation and maintenance in particular:

- Engineering design mainly as detailed engineering review
- Control and construction documents review
- Construction site supervision
- Procurement supervision
- Erection supervision
- Commissioning
- Acceptance testing up to warranty support during the initial operation period
- Development trainings: We have proven track record of providing on-the-job trainings throughout implementation of projects up to international conferences.
- O&M supervision: Based on our experience from the projects in which we were involved, we have a proven track record of consulting about O&M contracts and improving the O&M strategy after the COD is issued.

Furthermore we have a proven track record as Lender’s engineering, assessments of projects and due diligence reports for financing institutions.

We can also offer some presentations to Chinese institutions, developers and EPC contactors regarding to Site Selection Studies, Feasibility Studies, Owner`s Engineering Roles, Despicability of renewable energy etc.

Q: How could China’s CSP project better cooperate with international manufacturers?

A:We found that the supply and demand information between China domestic and overseas manufacturers is not asymmetric. For example, most often, domestic project developers have no ideas of who to turn to for specific
project implementation. What do you have in mind for better communication and cooperation between China domestic and overseas CSP industries?

I think that the value of a business opportunity depends upon the industrial context in which a company operates, and it can also be assumed that the opportunity identification logic of firms may be different across CSP industries.

EPC contractors needs to have reference projects. E.g. Zhejiang SUPCON Solar Technology Co., Ltd is building up an independent EPC contractor credibility. However, SEPCOIII has another strategy. SEPCOIII Electric Power Construction Corporation is working for SENER.

Component manufactures are mainly connected with international companies and therefore they can bid worldwide for subcontracting role in CSP projects much easier than potential Chinese EPC contractors.

In a rapidly changing world, organizations need to continually identify new opportunities beyond existing competencies if they want to survive and prosper.
I would suggest a multiple stage process:
1. share knowledge and profit from excellent international relations;
2. build up international BD team due to extend the value creation activities of the firm into technological or market areas that are relatively new to the firm and may be useful to support

the practice of co-creation of value with customers;
3. identification of business opportunities;
4. a quick response to pivotal opportunities;
5. networking, though conferences like CSP Plaza, LinkedIn and screening companies websites, which entrepreneurs open their outlooks and get the chance to identify new potential opportunities and cooperation with
companies adding value to their business plans.

For more information of SolengCo, please click the Web Link: SolEngCo.com