



Innovation in China: The Swiss Contribution

中国创新：瑞士企业的贡献

Switzerland's passion for new ideas and products has led Swiss firms to use this approach in their China operations, with varying tiers of innovation.

by **Mark Andrews**

Switzerland is well-known for innovation, and it ranked first in last year's INSEAD Global Innovation Index for the fourth year running. The reasons for this are various, but certainly, a great number of Swiss companies place great importance upon producing new products and ideas and taking them to market — something that has allowed them to compete around the world.

In comparison, China came in at 29th on the INSEAD index, one of the highest positions for a middle-income country, and even more impressive as it ranked 35th in the 2013 report. Multinationals have both contributed to and benefitted from this rise, and between 2000 and 2013, the number of foreign-invested R&D centres in China rose from fewer than 200 to over 1300. According to research from the CEIBS Centre for China Innovation, China is now the most popular country in the world

瑞士企业对新想法和新产品的热情在其中国运营的创新活动中得到了不同程度的发挥。

作者：**Mark Andrews**

瑞士以创新著称，在去年的英士国际商学院（INSEAD）全球创新指数排名中连续四年名列第一。原因是多方面的，当然，许多瑞士企业十分重视开发新产品和新想法及其市场推广——这也是许多瑞士企业在世界范围内能够取得成功的原因之一。

相比较而言，中国在 INSEAD 指数中排名第 29 位，对于中等收入国家而言这是最好的排名之一，相较 2013 年第 35 名的结果而言，这一成绩已经十分不俗了。跨国企业不仅为这一排名的提升作出了贡献，也从中获益良多。在 2000 年到 2013 年间，中国的外资研发中心数从不到 200 个增加到了 1,300 多个。中欧国际工商学院（CEIBS）中国创新中心的研究显示，目前中国

for companies to set up R&D facilities. The Chinese government is certainly pushing this trend, and has publicly set a target of having 2.5 per cent of GDP invested in R&D by 2020.

The relevance of China

Given the importance many Swiss companies traditionally place on innovation, one would expect that many firms would be important contributors to this development. Some have certainly invested heavily in China, where as others have moved more slowly in this regard. Novartis, who first set up an institute for biomedical research in China in 2006, grabbed headlines with an investment of over USD1bn in an R&D centre in Shanghai's Zhangjiang Hi-Tech Park. When completed, the new facility will be one of Novartis' top three research centres, along with one in the Swiss city of Basel and another in Massachusetts, USA.

Meyer Burger Group which specialises in high-tech production equipment, integrated solutions, systems and services with focus on the photovoltaic industry as well as other specialised industries including semiconductor has been locally present in China for many years, and in 2003 Meyer Burger opened a local sales and service office in Shanghai. Since then it has increased its focus to include after-sales, maintenance and service locations and in 2014 it launched its first 'Local for Local' manufacturing facility in China for the production of solar module encapsulation and laminating equipment. "Ours is a product on which you have to work with the customer very closely. You need to understand what the customers need, and so we decided to be closer to our customer," says Anita Schrag, Meyer Burger's vice GM of operations in China.

Meyer Burger has no R&D centre in China but its manufacturing facility in China collaborates very closely with product development in Europe to ensure that the local technology requirements in the Chinese market flows into the ongoing equipment development. The developments so far have been engineering-led and are related to product sustainability, including localising components. On their factory floor, Meyer Burger has a unit for testing machines destined for work in process control of the specific modular production. "Since these cannot be tested using the electricity supply directly to each module, this unit was developed in China to get over the problem," says Schrag.

The local dimension

Other companies, however, are doing more than simply adapting their products for the Chinese market. Thomas Schweizer, general manager China of Oerlikon Metco, says that his company has three types of projects in China, each of which require different levels of innovation. "In the first type, the project is transferred



Anita Schrag, Vice GM of Operations in China, Meyer Burger Technology
梅耶博格中国区运营副总经理 Anita Schrag

是企业设立研发中心的首选国家。中国政府也在推动这种趋势，并制定了到2020年研发投入占GDP 2.5%的目标。

中国的相关性

许多瑞士企业拥有重视创新的传统，可想而知许多企业都将是创新发展的贡献者。其中一些企业在中国倾注了巨额投资，还有一些企业进展缓慢。于2006年在中国设立了首个生

物医药研究中心的诺华公司投资10亿美元在上海张江高科技园设立研发中心的消息登上了新闻头条。建设完成后，该中心将成为诺华的前三大研究中心之一，另外两大中心分别位于瑞士巴塞尔和美国马萨诸塞州。

梅耶博格集团是一家主要为光伏行业以及包括半导体在内的其他特定行业提供高科技产品设备、一体化解决方案、系统和服务的公司，公司已经进入中国市场多年。2013年，梅耶博格在上海设立了本土销售和服务办公室。之后，梅耶博格不断增加对中国的投入，陆续建立了售后、维护和服务站点。2014年，公司在中国推出了首个“本土对本土”生产工厂，主要生产太阳能电池模块封装和层压设备。“我们的产品开发需要与客户密切合作，需要了解客户的要求，因此我们必须离客户更近一些，”梅耶博格中国区运营副总经理 Anita Schrag 说。

目前梅耶博格在中国尚未设立研发中心，但其在中国的工厂与欧洲的产品开发部密切合作，以保证中国市场对技术的要求体现在公司正在开展的设备开发工作中。公司迄今为止的发展都是工程导向的，都是关于产品的可持续性发展的，包括零配件的本土化等。梅耶博格的

工厂里有一个设备测试车间，主要用于具体的模块化生产的过程控制。“由于中国的电力不能直接用于对每个模块的测试，我们专门搭建了在这个测试车间来解决这个问题，”Schrag 说。

为了提高产品的利润率，梅耶博格改变了产



Thomas Schweizer, General Manager China of Oerlikon Metco
欧瑞康美科中国区总经理 Thomas Schweizer

from other parts of the world and so doesn't need local R&D," he says. "In the second, a product is developed for a local customer in a global context with the R&D work mainly done overseas. Nonetheless, in the third type — products developed in China for Chinese customers who are mainly local original equipment manufacturers — we really need local R&D capabilities."

The projects undertaken by Novartis in China have a local focus as well. "The CNIBR addresses unmet medical needs

in China and Asia with research that is focused on diseases that are endemic to the region," a spokesperson from Novartis' Institute for Biomedical Research in China (CNIBR) told the Bridge.

Nor are they unique in this regard. Swiss multinational DKSH opened an innovation centre in Guangzhou in 2013 to cater for the personal-care industry in the South China region. Their focus is more on creating products specifically for the Chinese market rather than pursuing truly global R&D.

Looking at the timeline, Professor George Yip, co-director of the CEIBS Centre for China Innovation, says that developing innovation in China for a global market is an evolutionary process. "The first, simple step involves adjusting the production process to local requirements," he says. In the next stage, which Yip believes, the majority of multinationals' R&D centres in China have arrived at, "companies adapt their products to local Chinese preferences," as can be seen with Oerlikon Metco. Indeed, Schweizer says that "Innovation as such is predominantly a subject considered outside of China while the focus in China is more towards application development". Some companies are now reaching Yip's third stage, in which they "integrate their China R&D activities with the ones they have elsewhere in the world, and designate their Chinese operations as global centres for some aspects of their R&D operations."

Integrating Chinese and overseas innovation

However, for the many Swiss companies who have not reached this third stage there is still a difference between the types of research that they do in China, and that elsewhere. "For instance, we typically develop and sell the core technology and related products for thermal spray from Europe and the US," says Schweizer.

The intellectual property rights (IPR) issue is still a key consideration for many companies deciding on what kind of innovation to do in China. "Our R&D centres are in Switzerland and Germany where we work closely with international research institutes in the ongoing development of PV tech-



Professor George Yip, Co-Director of the CEIBS Centre for China Innovation

中欧国际工商学院中国创新中心联席主任 George Yip 教授

品和生产工艺，但是目前公司在中国尚未设立研发中心，迄今为止的发展都是工程导向的，都是关于产品的可持续性发展的，包括零配件的本土化等。梅耶博格的工厂里有一个设备测试车间，主要用于测试那些针对不同电流频率市场的设备。“由于不能使用中国的电流进行测试，我们专门搭建了这个测试车间，” Schrag 说

本土化程度

不过，其他公司做的就不止于使产品适应中国市场这么简单了。欧瑞康美科公司中国区总经理 Thomas Schweizer 表示，公司在中国有三类项目，每类项目都要求不同水平的创新。“第一类项目是从世界其他地区转移过来的，因此不需要本土研发，”他说，“第二类项目的产品是为一个在全球运营的本土客户开发的，主要研发工作均在海外开展；第三类项目的产品是在中国开发的，针对中国客户——以本土原始设备制造商为主，在这一块我们需要本土研发能力。”

诺华在中国开展的项目也是以本土市场为侧重点的。“诺华中国生物医药研究所（CNIBR）解决中国和亚洲市场尚未得到满足的医疗需求，主要研究重点是区域内的地方性疾病，”诺华中国生物医药研究所发言人在接受《桥》的采访中说道。

这样做的企业并不只有诺华。瑞士跨国企业大昌华嘉（DKSH）于2013年在广州开设了创新中心，以顺应中国华南地区的个人医疗产业发展。他们的创新重点是开发针对中国市场的产品，而不是追求全球性的研发。

在时间方面，中欧国际工商学院中国创新中心联席主任 George Yip 教授表示，在中国开展针对全球市场的创新是一个进化的过程。“第一步很简单，包括依照本土要求调整生产工艺等，”他说。Yip 认为大多数跨国企业在华的研发中心已经达到了第二步，“企业根据本土中国客户的喜好调整产品”，这是欧瑞康美科正在做的。的确，Schweizer 表示“创新是我们首要在中国之外的其他国家考虑的课题，在中国仍主要侧重于应用发展”。

某些企业目前已经达到了 Yip 所说的第三阶段，它们“将中国的研发活动结合到企业在全世界其他地区开展的研发活动中，将中国运营定位成某些领域研发运营的全球中心”。

中外创新结合

然而，对于许多没有达到第三阶段的瑞士企业来说，它们在中国开展的研发工作与世界其他地区仍然有很大的不同。“举个例子来说，我们的核心技术和热喷镀相关的产品开发和销售都在欧洲和美国，” Schweizer 说。

nologies for global applications. The collaboration between our manufacturing locations worldwide however is very important to ensure that regional market requirements and differentiation is part of product development,” states Schrag.

There also seems to be a perceived communication gap. One issue, according to Schrag, is that R&D engineers in Europe are still discovering what they can learn from the Chinese, whereas engineers in China only focus on the product itself, rather than what they can deliver to the innovation stage of product development. Schweizer agrees, and says that “For the broad range of surface engineering technologies applied by us, China is yet to become an innovation driver or play an important role related to innovation.”

Much of this seems to be related to the perceptions of the talent available. “There is a big gap between the education of factory workers in Switzerland and China,” says Schrag. “In Switzerland, the people on the shop floor of an equipment manufacturer will typically have been through an apprenticeship programme, whereas in China, where apprenticeships are not common, we employ people with simpler skill sets and train them ourselves,” she says.

However, Schweizer says that the situation is now starting to change, due to the fact of more and more Chinese who have studied overseas. “In the past, China was very good at copying; however, innovation is now increasingly starting to happen, thanks to Chinese who have studied or lived abroad,” he says.

Novartis’s spokesperson takes a more positive view about the quality of employees available in China, which they describe as a “rich talent pool”. “Novartis has devoted a lot of resources to training young talent in China and ensuring they adopt our global standards of excellence and quality,” they say. “With over 300 associates and growing, including more than 200 scientists, CNIBR research teams are staffed by both Chinese scientists who have returned from abroad as well as graduates from top-tier universities, medical centres, and research institutes in China.”

These institutions, Novartis’ spokesperson says, offer further potential for MNCs to carry out innovative practices in China. “Novartis has also formed strong partnerships with Chinese universities and hospitals to collaborate on innovative researches and drug discovery,” they say.

As such, there are Swiss companies at all the stages outlined by Yip. While the approach has been cautious thus far, it is apparent that Swiss companies are looking to commit more to undertaking innovation in China. Schweizer says that Oerlikon Metco expects to gradually see far more innovation happening in China within the next five years, and Schrag makes a similar point. “If we develop a specific product for China, then I think we need drive the innovation from here,” Schrag says. “Product innovation is closely integrated to the strategic technology roadmap of a company which is an important factor for people to understand,” she adds. ○

许多企业决定将哪些创新活动放在中国时考虑的一个重要因素是知识产权问题。“我们的研发中心在瑞士和德国，我们与国际研究机构密切合作开展全球应用中的光伏技术发展工作。不过，我们在全球的生产工厂间的合作对于保证区域市场要求和差别在产品开发中得到体现也是十分重要的，” Schrag 说

还有一点就是人们理解和沟通上的差别。据 Schrag 介绍，他们面对的问题之一是瑞士的研发工程师仍然在探索他们能从中国同事那里学些什么，而另一方面，中国的工程师把工作重点放在产品本身，而不是思考如何将他们所学到的知识运用到新产品的创新中去。Schweizer 对此表示同意，并指出“在我们应用的许多表面工程技术上，中国还不是创新推动者，还没有在创新中担任重要的角色。”

人才的问题是原因之一。“瑞士和中国工厂的工人接受的培训差距较大，” Schrag 表示。“在瑞士，设备生产商车间里的工人一般都已经通过了学徒期，而在中国，学徒制不太普及，工人所拥有的技能较简单，需要在工作中进行培训，”她说。

不过，Schweizer 表示这种情况已经开始变化，因为有海外学习经验的中国人越来越多。“过去，中国的特长是抄袭；现在，那些在海外学习或生活过的中国人推动了越来越多的创新活动，”他说。

诺华发言人对中国现有的雇员素质持更为乐观的态度，他们将其描述为“丰富的人才库”。“诺华在培养中国年轻人才、保证他们采用全球品质和质量标准方面投入了很多资源，”他们如此说道，“我们在中国共有 300 余名助理人员，人数还在不断增加，包括 200 多名科学家，诺华中国生物医药研究所的研究团队既有海归科学家，也有来自中国一流大学、医疗中心和研究所的毕业生。”

诺华指出，这些研究所给跨国企业开展创新实践带来了更进一步的潜力。“诺华还与中国高校和医院建立了强大的伙伴关系，协作发展创新性研究和医药开发，”他们说。

因此，中国有 Yip 列出的处于各个阶段的瑞士企业。虽然瑞士企业采取了较为谨慎的策略，但是很明显的是它们在设法为中国正在发生的创新贡献更多。Schweizer 表示预计未来五年里欧瑞康美科在中国开展的创新活动将逐渐增多，Schrag 也持类似的观点。“如果我们在中国推出特定产品的话，我想我们必须推动在本地的创新活动，” Schrag 说，“产品创新是与企业的战略技术路线密切结合的，人们需要理解这个重要因素。○

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