

HANERGY THIN FILM POWER GROUP LIMITED  
漢能薄膜發電集團有限公司

(Incorporated in Bermuda with limited liability)

(於百慕達註冊成立之有限公司)

(Stock Code 股份代號: 566)



2017

ENVIRONMENTAL SOCIAL  
AND GOVERNANCE REPORT

環境、社會及管治報告

About This Report 關於本報告	2
<b>1. About Us 關於我們</b>	<b>3</b>
1.1. Company Profile 公司概況	3
1.2. Core Value 核心價值	5
1.3. Company Honors 公司榮譽	7
1.4. Operations with Incorruptibility 廉潔從業	7
<b>2. Responsibility Management 責任管理</b>	<b>9</b>
2.1. Materiality Analysis 重大性議題分析	9
2.2. Stakeholder Engagement 利益相關者參與	11
<b>3. Environmental Protection: A Road to Solar Energy 環境保護：我們的太陽能之路</b>	<b>15</b>
3.1. Green Development 促進綠色發展	15
3.2. Green Operations 實踐綠色運營	31
<b>4. Value to Share: Innovation and Cooperation 共用價值：我們的創新與合作</b>	<b>36</b>
4.1. Strengthening Technology Innovation 加強技術創新	36
4.2. Assuring Superior Quality 保證優良品質	39
4.3. Supply Chain Management 供應鏈管理	44
<b>5. The Talent Highland: Our Outstanding Team 人才高地：我們的卓越團隊</b>	<b>47</b>
5.1. Caring for Employees' Rights and Benefits 關注員工權益	47
5.2. Building a Platform for Employees' Development 構建發展平台	53
5.3. Creating a Family Atmosphere 營造家園氛圍	58
<b>6. Contribution to the Society: Our Philosophy of Philanthropy 奉獻社會：我們的公益之道</b>	<b>62</b>
6.1. Support for Regional Economic Development 助力區域經濟發展	62
6.2. PV Poverty Alleviation 光伏扶貧	65
Appendix: 附錄	68
HKEX ESG General Disclosures and KPIs	
香港聯交所《環境、社會及管治報告指引》內容索引	68

---

## About This Report

### Report Brief

This is the second released environmental, social and governance report of Hanergy Thin Film Power Group Limited. This report reviewed the main work of operation management of the Company in 2017. It disclosed the concept, practice and performance of its economic, social and environmental responsibility in Hanergy Thin Film Power Group Limited.

### Reporting Reference

This report is prepared with reference to The *Environmental, Social and Governance Reporting Guide* of Hong Kong Stock Exchange.

### Reporting Period

January 1, 2017–December 31, 2017. Some content and data may exceed the period.

### Reporting Cycle

This report is an annual report.

### Scope of Report

Unless otherwise stated, this report includes the headquarters and internal institutions of Hanergy Thin Film Power Group Limited and all its subsidiaries and branches.

### Data Sources

Financial data of the report are from the *2017 Annual Report* of Hanergy Thin Film Power Group Limited. Other data are sourced from its internal management system.

### Reporting Specification

For the convenience of expression, Hanergy Thin Film Power Group Limited hereinafter is referred to as “We”, “Hanergy Thin Film Power” and “the Company”. The Group Company of Hanergy Holding Group Limited is referred to as “Hanergy”, “Hanergy Holding Group”.

## 關於本報告

### 報告簡介

本報告為漢能薄膜發電集團有限公司發佈的第二份環境、社會及管治報告，回顧了公司2017年運營管理的主要工作，披露了漢能薄膜發電履行經濟、社會和環境責任的理念、實踐和績效。

### 編制依據

報告參照香港聯合交易所《香港上市規則》附錄二十七《環境、社會及管治報告指引》(簡稱ESG報告指引)編制。

### 報告年期

2017年1月1日至2017年12月31日。部分表述及資料有可能超出上述年份。

### 報告週期

本報告為年度報告。

### 報告範圍

如無特別說明，本報告覆蓋漢能薄膜發電集團有限公司總部、內設機構，及所有分、子公司。

### 資料來源

報告中的財務資料來自漢能薄膜發電集團有限公司2017年年報；其他資料來自公司內部管理系統。

### 指代說明

為便於表述，「漢能薄膜發電集團有限公司」在報告中分別用「我們」、「漢能薄膜發電」和「公司」指代；集團公司「漢能控股集團有限公司」用「漢能」、「漢能控股集團」指代。

## 1. About Us

### 1.1. Company Profile

Hanergy Thin Film Power Group Limited is a high-tech energy enterprise listed on the Hong Kong Stock Exchange. Its major businesses include: (i) R&D, design, sales and delivery of thin film solar module production equipment and turnkey production lines; (ii) solutions to distributed photovoltaic and mobile energy; and (iii) technical services such as support, construction and maintenance for customers of upstream production lines, downstream distributed photovoltaic and mobile energy solutions.

Since 2009, the Company has been focusing on thin film solar energy and has been actively involved in the investment and research of the most advanced thin film solar energy technology for many years. We believe that being thin and flexible will be the main trend of development in the future of the photovoltaic industry. If we are to succeed in the thin film power generation industry, we must always take the lead in technology. Based on this strategic judgment, we have constantly acquired a number of overseas thin film technologies, including Solibro in Germany, MiaSolé, Global Solar Energy, and Alta Devices in the U.S. Until now, we have mastered globally most advanced copper indium gallium selenide (CIGS) and gallium arsenide (GaAs) technologies and gained the capabilities to research, design, and deliver leading-edge equipment and production lines. Meanwhile, we deploy teams of scientists at various locations around the globe, including the United States, Germany and Sweden, and Beijing and Sichuan in China, etc, for continuous improvement in the performance of thin film power generation technology, which enables us to provide our customers with the most advanced and cost effective solutions in thin film solar turnkey production lines.

In the future, we will continue to maintain our position as the world's most advanced thin film power generation and high-tech energy company and adopt the "One Base and Two Fronts" as our long term strategic deployment. That is, we base ourselves on the continuous innovation of thin film solar technology. On the one hand, we deliver "turnkey solutions" for high-end equipment and production lines as one of the fronts, and on the other hand, we provide distributed energy and mobile energy "one-stop" solutions as the other front. The upstream equipment production line business will be maintained as our core, and the downstream distributed energy business will be our strategic direction, with an aim to vigorously fostering mobile energy as the Company's main direction.

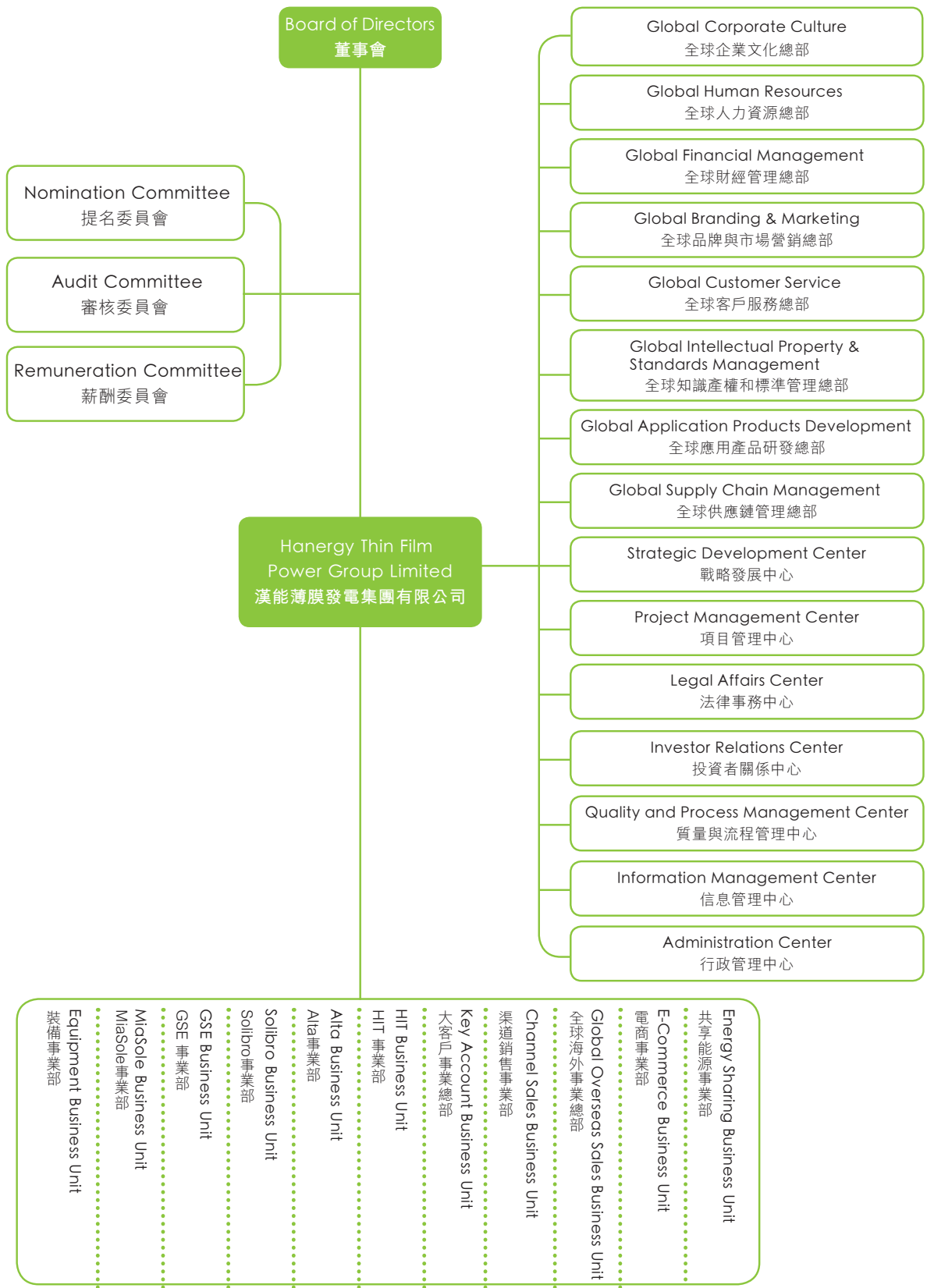
## 1. 關於我們

### 1.1. 公司概况

漢能薄膜發電集團有限公司是一家在香港交易所上市的高科技新能源企業，主要業務包括(i)薄膜太陽能組件生產裝備及整線生產線之研發、設計、銷售及交付；(ii)提供分佈式光伏及移動能源的解決方案；及(iii)向我們上游生產線、下游分佈式光伏及移動能源解決方案的客戶提供支援、建設及維護等技術性的服務。

自二零零九年開始，公司已經專注薄膜太陽能領域，多年來積極投入與研發最先進薄膜太陽能技術。我們相信薄膜化、柔性化將會是光伏產業發展的未來主要趨勢，如果要在薄膜發電行業取得成功，技術就必須永遠領先；基於這一戰略判斷，我們通過持續併購多間領先之海外薄膜技術公司，包括德國Solibro公司、美國MiaSolé公司、美國GlobalSolarEnergy公司及美國AltaDevices公司，目前已掌握全球最領先的銅銦鎵硒(CIGS)和砷化鎵(GaAs)技術，具有領先裝備產線的研發、設計及交付能力。公司科學家團隊遍佈全球，包括美國、德國、瑞典及中國北京、四川等，致力於薄膜太陽能技術的持續提升，為客戶提供最先進的薄膜太陽能整線生產線解決方案。

未來，我們將繼續保持全球領先薄膜太陽能發電高科技新能源公司的位置，以「一基兩翼」為長遠佈局：即以薄膜太陽能技術的持續創新為基礎，以高端裝備及產線的「交鑰匙」解決方案為左翼，以分佈式光伏及移動能源的解決方案為右翼，以上游裝備產線業務為核心，下游分佈式光伏業務為戰略方向，積極培育移動能源業務作為集團的大方向。



Organizational Structure of Hanergy Thin Film Power  
漢能薄膜發電集團組織架構圖

1.2. Core Value

1.2. 核心價值





# 18 Hanergy Mottos

## 漢能司訓

### 十八條

**1** It is our mission and faith to change the world with thin-film solar.  
用薄膜太陽能改變世界是我們共同的信仰

**2** Integrity, generosity, wisdom and inclusiveness comprise our character.  
正氣、大氣、睿智、包容是我們的氣質

**3** Foresight and pragmatism are our qualities.  
遠見、務實是我們的風格

**4** Loyalty, responsibility and ambition are our basic requirements.  
忠心、責任心、上進心是我們的基本要求

**5** The secret of success is to focus on our customers, and provide them with the best product, service and experience.  
生存的奧秘：以客戶為核心，為客戶提供最好的產品、最好的服務和最好的體驗

**6** The secret of company development is to grow with employees as they grow.  
發展的奧秘：與員工共成長

**7** Success is determined by these three factors: people, people and people.  
成功的奧秘：第一靠人，第二靠人，第三還是靠人

**8** The secret of an evergreen enterprise is everlasting improvement and innovation.  
長青的奧秘：持續變革與創新

**9** The absence of ethics negates everything.  
品德問題是零因子，零乘億萬等於零

**10** Integrity is of the essence.  
誠信，是根

**11** Diligence and passion determine half of success.  
勤奮和充滿激情地工作，已成功了一半

**12** Results talk; dignity comes from achievements.  
結果第一，尊嚴來自業績

**13** Execution without excuses.  
執行，沒有藉口

**14** Learn everyday.  
天天學習

**15** Introspect everyday.  
天天反省

**16** Be grateful everyday.  
天天感恩

**17** At Hanergy, nothing is impossible.  
漢能，沒有不可能

**18** Hanergy, be great for the world.  
漢能，因祖國強大而強大

### 1.3. Company Honors

- The Company won Liepin “2017 Extraordinary Employer Award”.
- The Company was the only Chinese thin film solar power company which was listed in “Global Renewable Energy Top 25” by Thomson Reuters.
- The Company’s portable thin film solar power product won Gold Award in product innovation category of 2017 ECI Awards and The Grand ECI.
- The Company won “2017 Annual Integrated Marketing Award” in the “10th Time Marketing Awards” held by Time Weekly.
- The thin-film colour-powered building integration project of the headquarters of the State Power Investment Corporation won “2017 Special Prize for Excellent Projects of National Distributed Energy” in 2017 (the 13th) International Symposium for Chinese Distributed Energy and 2017 China Distributed Energy Award Ceremony, which are co-held by China Energy Research Society and China Communications Industry Association.

### 1.4. Operations with Incorruptibility

Hanergy Thin Film Power attaches great importance to clean governance and resolutely opposes any form of corruption. In accordance with the relevant provisions of the national laws and ethical regulations, the Company has formulated the *Measures for the Implementation of Anti-corruption, Anti-bribery, and Anti-fraud* combined with the actual situation of governance. It has explicitly defined corruption, bribery, fraud, and methods to deal with the violations, ensuring legal and honest business operations. In addition, the Company’s contracts signed with its business partners include content involving anti-bribery and anti-fraud such as the *Statement for Incorruptibility in Project Supervision, Corporate Integrity Agreement, and Incorruptibility Contract* to standardize its business dealings and establish an honest and trustworthy business relationship with partners. These efforts are made to promote clean governance in the business area.

Fostering a clean corporate culture is an important part of corporate clean governance. The Company promulgated the *Fifty Injunctions* to clearly define the illegal behaviors and disciplinary measures of bribery, embezzlement, and misappropriation, so as to strengthen the employees’ awareness of fighting corruption and advocating integrity and make them consciously stay away from the red line of clean governance. At the same time, the Company gives play to the fundamental and leading role of education in the

### 1.3. 公司榮譽

- 公司獲評2017年度獵聘非凡僱主大獎
- 公司入選湯森路透首個「全球可再生能源25強」榜單，是中國唯一上榜的薄膜太陽能企業
- 公司可攜式薄膜太陽能發電產品摘得2017年度ECI Awards產品創新類金獎及全場大獎
- 公司漢瓦發佈會在《時代週報》主辦的「第十屆時代行銷盛典」中榮獲「2017年度整合行銷獎」
- 採用公司太陽能技術的「國電投」總部大樓薄膜太陽能建築一體化專案在中國能源研究會、中國通信工業協會主辦的2017（第十三屆）中國分布式能源國際論壇暨2017年度中國分布式能源優秀獎頒獎典禮中摘得「2017年度中國分布式能源優秀專案獎特等獎」

### 1.4. 廉潔從業

漢能薄膜發電高度重視廉政管理工作，堅決反對任何形式的腐敗。公司依據國家法律和道德規範的相關規定，結合實際管理情況，制定《反腐敗反賄賂反欺詐實施辦法》，明確指出腐敗、賄賂、欺詐行為及處理方式，保證合法誠信經營。此外，公司與商業夥伴簽訂的合同中包含《工程監理廉政責任書》、《廉潔協議書》、《廉政合同》等涉及反賄賂反欺詐的內容，以規範雙方業務往來活動，建立誠實守信的業務合作關係，在業務領域推進廉政建設。

廉潔文化建設是公司廉政管理中的重要一環。公司頒佈《禁令50條》，明確界定行賄、職務侵佔、挪用資金等違法違紀行為及處分方式，強化員工反腐倡廉認知，自覺遠離廉潔紅線。同時，公司發揮教育在廉潔文化建設中的基礎和先導作用，將監察培訓納入新員工入職培訓課程，並在日常巡視中對監察單位進行監察制度和典型案例的培訓，以幫助員工瞭解公司反腐敗反賄賂反欺詐政策和



construction of a clean culture. It has incorporated training on supervision into the new employee induction curriculum and provided training on supervisory systems and typical cases to supervisory units in day-to-day inspections. These measures help employees understand the Company's policies and requirements on anti-corruption, anti-bribery and anti-fraud, and enhance their awareness of honesty and self-discipline. In 2017, the Company provided training on supervision 7 times for new employees and cumulatively 712 people participated in the training.

The Company protects and upholds employees' right to report and to complain and establishes reporting channels such as email boxes and mail boxes for anti-corruption, anti-bribery and anti-fraud. Employees can report if they find suspicious signs and behaviors, or any suspicious facts and circumstances that may involve corruption, bribery, and fraud. After receiving complaints and reports, the Company will formulate a special inspection plan to investigate reports and collect documentary evidence. In addition to special inspections, the Company conducts routine inspections to supervise all economic and management activities of all units and employees' due diligence and compliance. The Company also issues feedback forms after inspections to offer its opinions and propose rectifications, or in the case of violations suggests and implements disciplinary actions. In 2017, the Company took inspection tours to 6 units and 12 companies or departments and implemented 8 special inspections.

During the reporting period, thanks to its efforts in proactive prevention, mid-term supervision, timely handling, and clean culture construction, the Company experienced no lawsuits involving bribery, extortion, fraud, or money laundering.

要求，增強廉潔自律的自覺性。2017年，公司為新員工提供監察培訓7次，累計培訓712人。

公司維護並支持員工的投訴舉報權利，設立反腐敗反賄賂反欺詐郵箱、信箱等舉報途徑。員工若發現「可疑情況」、「危險信號」、「可疑行為」及任何可能涉及腐敗、賄賂、欺詐的可疑事實和情況可進行舉報。接到投訴、舉報後，公司將制定專項監察方案，對舉報情況進行調查，收集文件等書面證據。除了專項監察，公司還開展日常巡視，對各單位一切經濟和管理活動及員工履職盡責和遵規守紀情況進行監察，下發問題反饋表，發表監察意見並監督整改，對於違規違紀行為，提出處分建議並落實。2017年，公司對6家單位及12家公司或部門進行了巡視監察，實施專項監察8次。

報告期內，公司通過前期防範、中期監控、後期處置以及廉潔文化建設等工作的開展，沒有涉及賄賂、勒索、欺詐及洗黑錢的訴訟案件發生。



Training on Routine Inspection Mechanism and Case  
日常巡視監察制度與案例培訓

## 2. Responsibility Management

The Company always adheres to responsibility management and compliance operation, striving to build a responsible, honest, and compliant management system, and to reflect the value of corporate social responsibility through materiality analysis and stakeholder engagement.

### 2.1. Materiality Analysis


To enhance the pertinence and responsiveness of the report, with reference to the *Environmental, Social and Governance Reporting Guide* released by the Hong Kong Stock Exchange, the Company has identified sustainable development issues and evaluated the material issues, and ensured that this report could fully disclose the important information of corporate development and prioritized issues of stakeholders concern.

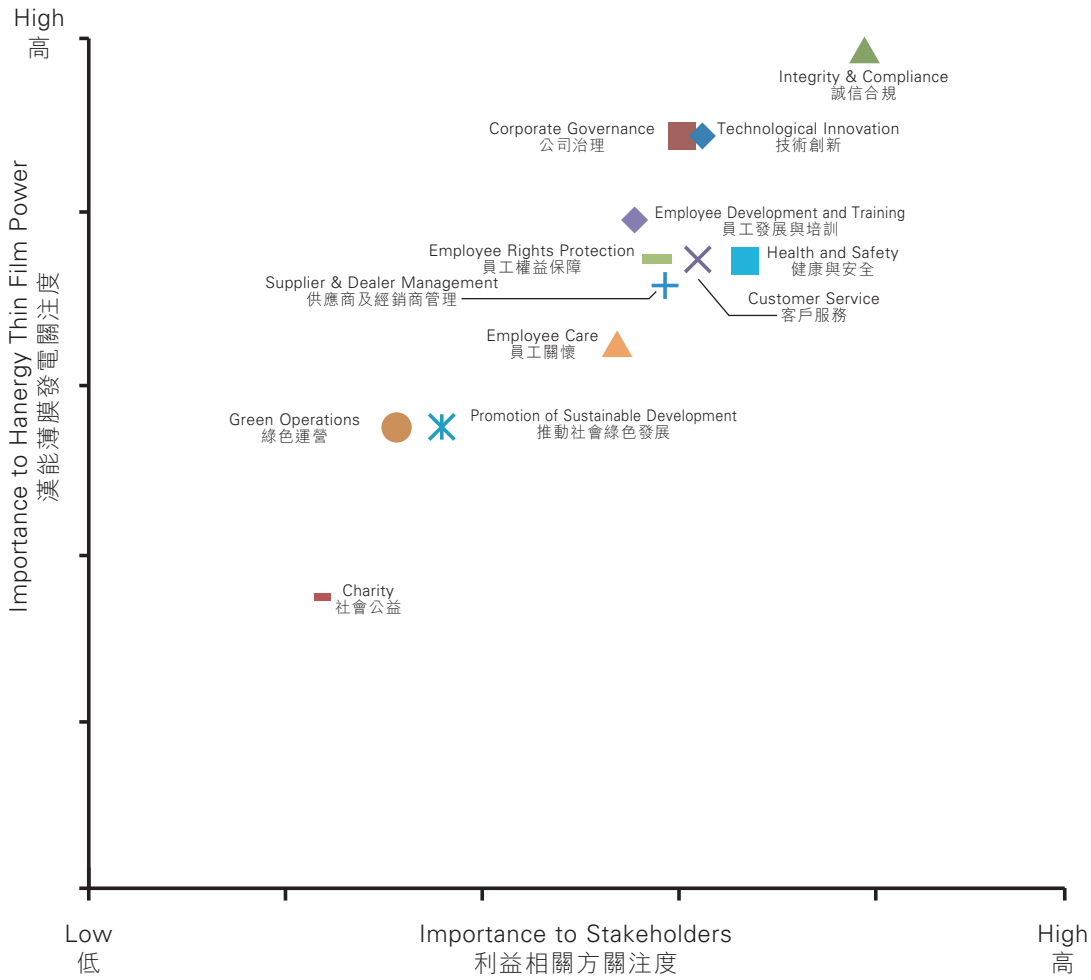
## 2. 責任管理

公司始終堅持責任治理、合規經營，力求通過重大性議題分析及利益相關者參與來構建負責任、誠信、合規的管理體系，體現企業社會責任價值。

### 2.1. 重大性議題分析

為提升報告的針對性與回應性，公司依據香港聯合交易所《環境、社會及管治報告指引》的要求，識別可持續發展議題並進行重大性判定，確保報告披露的資訊全面覆蓋公司發展和權益人關注的重點議題。

Screening Flow on Environmental, Social and Governance Issues 環境、社會及管治議題篩選流程	
	<b>Issue Sources 議題來源</b> <ul style="list-style-type: none"> <li>- Corporate management suggestions 公司管理層建議</li> <li>- Internal and external experts' analysis and suggestions 內外部專家分析建議</li> <li>- Media information analysis 媒體資訊分析</li> <li>- National and international peer companies benchmarking study 國內外同業對標研究</li> <li>- Social responsibility guidelines 社會責任標準指南</li> </ul>
	<b>Screening Standard 篩選標準</b> <ul style="list-style-type: none"> <li>- Contribution to sustainable development 對可持續發展的貢獻</li> <li>- Stakeholders' concerns 利益相關者普遍關注</li> <li>- Focuses of social responsibility guidelines 社會責任相關指南重點強調</li> <li>- Accordance with the needs of corporate strategic development 符合公司戰略發展需要</li> </ul>
<b>Results of Materiality Analysis 重大性判定結果</b>	
<p>Through the above evaluation process, we identified and prioritized 12 important issues of social responsibility in Hanergy Thin Film Power. They are part of the content of this report, which cover many areas, such as corporate governance, environment, products and services, employee, community and etc. We will disclose the detailed contents in this report.</p> <p>通過以上評估過程，我們識別出漢能薄膜發電12個重要的社會責任議題並進行重要性排序，涵蓋企業管治、環境、產品與服務、員工、社區等多個領域，構成本報告內容的組成部分，我們將會在本報告內詳細披露有關內容。</p>	



- ◆ Technological Innovation  
技術創新
- + Supplier & Dealer Management  
供應商及經銷商管理
- Corporate Governance  
公司治理
- Charity  
社會公益
- ▲ Integrity & Compliance  
誠信合規
- Employee Rights Protection  
員工權益保障
- × Customer Service  
客戶服務
- ◆ Employee Development and Training  
員工發展與培訓
- ✕ Promotion of Sustainable Development  
推動社會綠色發展
- Health and Safety  
健康與安全
- Green Operations  
綠色運營
- ▲ Employee Care  
員工關懷

## 2.2. Stakeholder Engagement

Strengthening communication and cooperation with stakeholders is a necessary condition for business development. Hanergy Thin Film Power places high emphasis on communication with stakeholders. The Company regularly invites stakeholders to visit its showrooms, holds new product launches, among other things, to enhance mutual understanding. It also takes pertinent measures to meet the legitimate expectations and requirements of stakeholders and to identify opportunities for cooperation and common development.

## 2.2. 利益相關者參與

加強與利益相關者的溝通和合作是業務發展的必要條件。漢能薄膜發電高度重視與利益相關者的溝通交流，通過定期邀請他們參觀公司展廳，召開新品發布會等形式增進彼此的瞭解，並採取應對措施，滿足利益相關者合理期望與要求，識別合作機會，實現共同發展。

Stakeholders 利益相關者	Expectation and Requirements 期望與要求	Communication and Response Approaches 溝通與回應方式
Government and Regulatory Authorities 政府與監管機構	<ul style="list-style-type: none"> <li>• Implementing national policies and regulations 貫徹落實國家政策及法律法規</li> <li>• Promoting local economic development 促進地方經濟發展</li> <li>• Promoting local employment 帶動地方就業</li> <li>• Leading industry development 引領產業發展</li> <li>• Strengthening independent innovation 強化自主創新</li> </ul>	<ul style="list-style-type: none"> <li>• Report the relevant document 上報文件</li> <li>• Advice and suggestions 建言獻策</li> <li>• Special report 專題匯報</li> <li>• Establishing industry standards 制定行業標準</li> <li>• Participating in the formulation of industry policies 參與行業政策制定</li> </ul>
Shareholders 股東	<ul style="list-style-type: none"> <li>• Return on investment 收益回報</li> <li>• Compliance operation 合規營運</li> <li>• Improving corporate governance 完善公司治理</li> <li>• Risk management 風險管理</li> </ul>	<ul style="list-style-type: none"> <li>• Company announcement 公司公告</li> <li>• Special report 專題匯報</li> <li>• On-site visit 實地考察</li> <li>• Shareholder decision-making 股東決策</li> </ul>
Customers and Cooperative Partner 客戶及合作夥伴	<ul style="list-style-type: none"> <li>• Performance contract in accordance with law 依法履約</li> <li>• Honest operation 誠信經營</li> <li>• Green operation 綠色營運</li> <li>• Products and services of high quality 優質產品與服務</li> <li>• Protecting customer rights 保護客戶權益</li> </ul>	<ul style="list-style-type: none"> <li>• Business communication 商務溝通</li> <li>• Customer feedback 顧客反饋</li> <li>• Communication and discussion 交流研討</li> <li>• Discussion of the cooperation 洽談合作</li> </ul>

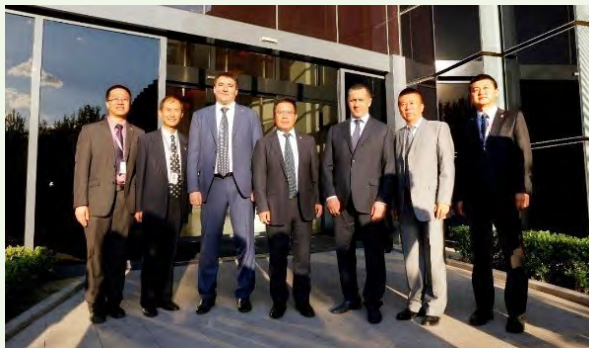
Stakeholders 利益相關者	Expectation and Requirements 期望與要求	Communication and Response Approaches 溝通與回應方式
Environment 環境	<ul style="list-style-type: none"> <li>• Promoting society to concern environmental protection 帶動社會環保</li> <li>• Compliant emission 合規排放</li> <li>• Saving energy and reducing emissions 節能減排</li> <li>• Ecological conservation 保護生態</li> </ul>	<ul style="list-style-type: none"> <li>• Work report 工作匯報</li> <li>• Report submission 報表提交</li> <li>• Investigation and inspection 調研檢查</li> </ul>
Employee 員工	<ul style="list-style-type: none"> <li>• Rights maintenance 權益維護</li> <li>• Occupational health 職業健康</li> <li>• Remuneration and benefits 薪酬福利</li> <li>• Career development 職業發展</li> </ul>	<ul style="list-style-type: none"> <li>• Workers congress 職工代表大會</li> <li>• Collective negotiation 集體協商</li> <li>• Democratic communication platform 民主溝通平台</li> </ul>
Community and Public 社區及公眾	<ul style="list-style-type: none"> <li>• Improving community environment 改善社區環境</li> <li>• Participating in public welfare activities 參與公益事業</li> <li>• Advocating volunteer service 宣導義務工作</li> <li>• Open and transparent information 資訊公開透明</li> </ul>	<ul style="list-style-type: none"> <li>• Company website 公司網站</li> <li>• Company announcement 公司公告</li> <li>• Interview and communication 採訪交流</li> <li>• Information disclosure 資訊披露</li> </ul>

Case: Hanergy Thin Film Power Showroom Accepting Visits to Promote Green Civilization

案例：漢能薄膜發電開展倡導綠色文明的參觀接待活動

In 2017, Hanergy Thin Film Power organized company tours to promote green civilization. In total, it organized 6,654 tours and invited 46,600 stakeholders from government departments, research institutes, partners, and customers to Hanergy Thin Film Power showrooms. During these visits, the Company introduced its solar energy products to stakeholders and disseminated the concept of green development, which helped stakeholders understand the contribution of solar energy products to energy conservation and emission reduction, raised their awareness of clean energy, and inspired them to make a contribution to the sustainable green development.

漢能薄膜發電在2017年舉行了多個參觀接待活動，以開展及倡導綠色文明，共計邀請了46,600餘名從政府部門、科研機構、合作夥伴、客戶等持份者，舉行了6,654次漢能薄膜發電展廳的參觀接待活動。漢能薄膜發電向利益相關方介紹公司太陽能產品，傳播綠色發展觀念，幫助利益相關方瞭解太陽能產品對節能減排的貢獻，提升對清潔能源的認知，鼓勵利益相關方為實現綠色可持續發展做出貢獻。



A Visit of Russian Deputy Prime Minister and His Party  
俄羅斯副總理等一行人參觀訪問



Sir David King, Representative for British Foreign Affairs and Climate Change  
英國外交與英聯邦氣候變化代表大衛金爵士參觀訪問





A Visit of Turkish Deputy Minister of Energy  
土耳其能源部副部長參觀訪問



Delegation of Kingdom of Thailand Development  
Foundation  
泰國普密泰發展基金會參觀訪問



Ghanaian Delegation  
加納代表團參觀訪問



Delegation of Rothschild Group in the Company  
洛希爾集團訪問漢能薄膜發電

### 3. Environmental Protection: A Road to Solar Energy

Adhering to the mission of “change the world with thin-film solar”, Hanergy Thin Film Power put the statement of 19th National Congress of CPC into action that “we will promote a revolution in energy production and consumption, and build an energy system that is clean, low-carbon, safe, and efficient.”. The company is committed to providing comprehensive solutions with thin film solar power generation products to help companies promote energy conservation and emission reduction and achieve green development together. At the same time, harboring the concept of green and clean operation, the Company endeavors to minimize the impact of its operations on the environment and to realize the coordinated development of business operations and environmental protection.

#### 3.1. Green Development

With the increasingly severe contradiction between economic development, resource consumption and environmental impact, more and more companies are turning their attention to the application of clean energy. As a leader in the thin film solar industry, Hanergy Thin Film Power has introduced a host of innovative thin film solar products to fully exploit the clean energy with its own advantage of innovative technology. It has also integrated and upgraded its products to provide comprehensive solutions to environmental problems caused by business operation and production processes, so as to meet the growing demand for clean energy and promote social green development.

##### 3.1.1. Eco-City Comprehensive Solution

In December 2017, Hanergy Thin Film Power launched the “Eco-City Comprehensive Solution”, which aims to reduce energy consumption in cities under the national new energy development strategy. With thin film solar power generation as its core technology, this solution entails a comprehensive layout of energy in cities from the aspects of macro planning, business consulting, program design, construction and implementation, and operation and maintenance services. It is an energy solution package covering green buildings, green parks, green transport, green government, green agriculture, green electronics, water ecology and waste management, thus to meet the needs of eco-environmental protection and help the green development of cities.

### 3. 環境保護：我們的太陽能之路

漢能薄膜發電始終以「用薄膜太陽能改變世界」為使命，貫徹中共十九大報告中提出的「推進能源生產和消費革命，構建清潔低碳、安全高效的能源體系」，致力於通過推出薄膜太陽能發電產品，提供綜合解決方案，助力企業推進節能減排，共同實現綠色發展。同時，漢能薄膜發電依託綠色清潔運營的理念，最大程度減輕自身運營對環境造成的影響，實現企業經營與環境保護的協同發展。

#### 3.1. 促進綠色發展

隨著經濟發展與資源消耗和環境影響的矛盾日益嚴峻，越來越多的企業將目光投向清潔能源的應用。漢能薄膜發電作為薄膜太陽能行業的領導者，憑藉自身創新技術優勢，先後推出多種頗具創新性的薄膜太陽能產品，充分開發清潔能源利用效率，同時將產品進行整合升級，提供綜合解決方案，以解決企業經營生產過程中造成的環境問題，滿足不斷增長的清潔能源需求，促進社會綠色發展。

##### 3.1.1. 生態城市綜合解決方案

2017年12月，漢能薄膜發電推出了生態城市綜合解決方案，該方案是在國家新能源發展戰略下，以降低城市能源消耗為目標，利用薄膜太陽能發電為核心技術，通過對城市能源全面佈局，從宏觀規劃、業務諮詢、方案設計、建設實施、運維服務等方面入手，提供一攬子綜合能源解決方案，涵蓋綠色建築、綠色園區、綠色交通、綠色政務、綠色農業、綠色電子、水生態和廢物處理等方面的應用，進而協同滿足生態環保等需求，助力城市綠色發展。



<p><b>Green Buildings</b> 綠色建築</p>	<p>Green Buildings aim to integrate thin film solar technology with architecture, applying green building materials such as “Hantile” and building-integrated photovoltaic products to increase the environmental value of buildings from such aspects as product development, system design, installation and construction, operation and maintenance.</p> <p>綠色建築解決方案旨在將太陽能薄膜技術與建築緊密結合，應用漢瓦等綠色建築材料以及光伏建築一體化產品，從產品開發、系統設計、安裝施工和運行維護等方面提升建築環保價值。</p>
<p><b>Green Parks</b> 綠色園區</p>	<p>Green Parks mainly use micro-grids and multi-energy complementation to achieve the shift to clean alternatives and electrical energy and to change the mode of economic development in a coordinated manner. The overall energy layout of the parks is planned to make effective use of all resources. A system is designed from energy acquisition to energy consumption, incorporating rooftop resources, wall resources, shading systems, shed resources, ground resources, and outdoor lighting into the green energy eco-system, thus to create energy-saving green parks.</p> <p>綠色園區解決方案主要利用微電網和多能互補，實現清潔替代和電能替代，統籌協調改變經濟發展方式。從園區整體能源佈局進行規劃，有效利用各項資源，建立從能源獲取到能源消耗的系統設計，將園區屋頂資源、牆面資源、遮陽系統、棚頂資源、地面資源、戶外照明納入綠色能源生態系統，打造節能綠色園區。</p>

<p><b>Green Transportation</b> 綠色交通</p>	<p>Green Transportation aims to ease the tension of energy supply for transportation and to make an overall layout of energy supply for the transportation system. The thin film solar technology is applied to new energy vehicles, smart bus station platforms, parking shed signal systems, lighting, highway energy and other fields. Electricity is generated during the day and supplied at night to reduce utility power supply for urban transportation, reduce energy consumption and pollution.</p> <p>綠色交通解決方案主要為了緩解交通所需的能源供應，整體佈局交通系統能源供應，將太陽能薄膜技術應用於新能源汽車、智慧公交月台、停車棚信號能源、照明、高速公路能源等領域，通過白天發電，夜間供電，為城市交通減少市政供電，降低能耗和污染。</p>
<p><b>Green Government</b> 綠色政務</p>	<p>Hanergy's green government solution aims to create cities with near-zero carbon emissions. It features a new energy layout as its core, applying such tools as the Internet of Things and Big Data to the smart governance of cities. It also adopts more comprehensive perception and data collection, more efficient transmission and data sharing, and smarter analysis and data mining to help the government build green, harmonious and livable cities.</p> <p>漢能綠色政務解決方案以打造近「零」碳排放城市為目標，以新能源佈局為核心，結合物聯網、大數據等工具進行城市智慧管理，採用更全面的感知及資料收集、更高效的傳輸及資料共用、更智慧的分析及資料採擷體系，幫助政府構建綠色、和諧、宜居城市。</p>
<p><b>Green Agriculture</b> 綠色農業</p>	<p>Green Agriculture makes integrated use of clean energy and eco-environmental protection technologies to carry out photovoltaic poverty alleviation projects and support the construction of modern agricultural parks and rural areas featuring high efficiency and environmental protection.</p> <p>綠色農業綜合解決方案綜合運用清潔能源和生態環保技術，開展光伏扶貧項目，支援現代高效環保農業園區和鄉村建設。</p>
<p><b>Green Electronics</b> 綠色電子</p>	<p>Green Electronics applies thin film solar power generation technology to all aspects of the daily life of urban and rural residents such as smart wear, home life, electronic devices, outdoor sports gear to develop portable mobile energy equipment.</p> <p>綠色電子綜合解決方案將太陽能薄膜發電技術應用於城鄉居民日常生活中的各種智慧穿戴、家居生活、電子設備及戶外運動裝備等方面，實現可攜式移動能源裝備。</p>
<p><b>Water Ecology</b> 水生態</p>	<p>Water Ecology aims to organically combine distributed power plants with sewage treatment. Distributed photovoltaic power generation equipment is built above the sewage treatment plant, which not only helps sewage treatment, but also addresses the power supply to sewage treatment equipment and contributes to landscaping.</p> <p>水生態綜合解決方案旨在將分佈式電站與污水處理進行有機結合，通過在污水處理廠上方建設分佈式光伏發電設備對污水進行處理，同時解決了污水處理設備供電和環境美化問題。</p>

**Waste Treatment**  
廢物處理

The waste treatment solution is dedicated to the launch of a photovoltaic waste treatment method. A distributed power station is installed at the waste disposal plant, using clean energy for power generation to treat municipal solid waste, construction waste, plant waste, and kitchen garbage. With more than 95% of wastes recycled, this approach replaces traditional methods such as incineration and landfill, reducing environmental pollution.

廢物處理綜合解決方案致力於推出光伏垃圾處理方法，在垃圾處理場加裝分佈式電站，利用清潔能源供電處理生活垃圾、建築垃圾、植物垃圾、廚餘垃圾，實現95%以上資源化，替代傳統焚化、堆填等處理方式，降低環境污染。

**Case: Hanergy Thin Film Power's Eco-City Comprehensive Solution to Bolster Green Industry Development**

案例：漢能薄膜發電發佈生態城市綜合解決方案，助力綠色產業發展

On December 15, 2017, the Company held a press conference for "Green China - Hanergy Eco-City Comprehensive Solution" in Beijing, where the Company signed strategic cooperation agreements with 12 enterprises including Beijing New Energy Automotive Co., Ltd., CSSC No. 605 Institute, Haier, Inspur, IPPR, and Etuoqianqi Shuidonggou Tourism Development Co., Ltd. to jointly promote the development of China's green industry.

The Company will have multi-form, multi-level cooperation in technology, projects and industry with these 12 companies in such aspects as green transport, green parks, green buildings, and big data. In this process, the Company will fully tap its own advantages, solve social energy issues, and join others to promote the development of a low energy-consuming green industry.

2017年12月15日，漢能薄膜發電在北京舉辦「綠色中國——漢能生態城市綜合解決方案」發佈會，並在現場與北京新能源汽車股份有限公司、中國船舶工業集團第六〇五研究院、海爾、浪潮、中元國際、鄂托克前旗水洞溝旅遊開發有限公司等十二家企業簽署了戰略合作協議，共同助力我國綠色產業發展。

公司將與這十二家企業在綠色交通、綠色園區、綠色建築、大數據等方面進行多形式、多層次的技術、專案和產業合作，充分挖掘自身優勢，解決社會能耗問題，共同推進低耗能綠色產業發展。



### 3.1.2. Green Buildings

At present, half of the world's raw materials and energy are consumed by buildings. Energy-saving construction is an inevitable trend of development in architecture. Paying attention to solar energy application in architecture, Hanergy Thin Film Power has creatively launched the "Hantile" and BIPV (Building Integrated Photovoltaic) projects to fully exploit the advantages of thin film solar energy. It provides one-stop solutions for product development, product supply, system design, installation and construction, operation and maintenance, and reduces the consumption of traditional energy sources and pollutant emissions while ensuring an effective energy supply.

In July 2017, the Company launched a new type of green building material - "Hantile." Hantile is the perfect combination of high-efficiency thin film solar modules and laminated glass. The CIGS thin film solar chip is encapsulated into the inner layer of highly transmissive glass via an internal and external dual-layer encapsulation process. In this way, the high conversion rate of thin film solar energy is retained as much as possible, while rooftop solar power generation is realized on the basis of safety and durability. The design also combines the shape of Chinese traditional arched tiles. Hantile's energy-saving and emission-reducing effects are significant. According to data, one Hantile's current power is 35 watts, generating 40 kWh of electricity a year, equivalent to emission reduction of one tree a year. As of now, Hantile has been applied to a number of architectural designs, including the photovoltaic tile project of a nursing home in Jilin and photovoltaic tile projects in Shunyi of Beijing, Sixian of Anhui and Yunnan.

### 3.1.2. 綠色建築

目前全球半數的原材料和能源使用來自建築類消耗，節能建築是未來發展的必然趨勢。漢能薄膜發電關注在建築方面的太陽能應用，創造性地推出漢瓦以及光伏建築一體化(Building Integrated Photovoltaic, 簡稱「BIPV」)項目，充分發揮薄膜太陽能的優勢，在產品開發、產品提供、系統設計、安裝施工和運行維護上提供一站式解決方案，在保證有效能源供應的前提下降低傳統能源消耗，減少污染物排放。

2017年7月，公司推出新型綠色建築材料——「漢瓦」。漢瓦是將高效薄膜太陽能組件和安全玻璃進行完美結合，將銅銦鎵硒(CIGS)薄膜太陽能晶片通過內外雙層的夾膠封裝工藝，封裝在高透光度玻璃內層中，儘可能保持薄膜太陽能的高轉換率特性，在安全耐用的基礎上實現屋頂太陽能發電，並結合了中國傳統拱形瓦片的造型而設計製造。漢瓦的節能減排效果顯著，有資料表示，一片漢瓦目前的功率是35瓦，一年產生40度電，一片瓦一年發的電量相當於一棵樹一年的減排量。目前，漢瓦已被應用於多項建築設計，包括吉林養老院光伏瓦項目、北京順義光伏瓦項目、安徽泗縣光伏瓦項目以及雲南的光伏瓦項目等。





Photovoltaic tile project of a nursing home in Jilin  
吉林養老院光伏瓦項目



Photovoltaic tile project in Shunyi, Beijing  
北京順義光伏瓦項目



Photovoltaic tile project in Si County, Anhui  
安徽泗縣光伏瓦項目



Photovoltaic tile project in Yunnan  
雲南光伏瓦項目

Using BIPV technology, the BIPV project installs thin film solar systems such as photovoltaic tile roofs, photovoltaic sunroofs, photovoltaic curtain walls, photovoltaic railings, photovoltaic sunshades, and photovoltaic parking sheds. These systems use solar energy resources to provide free clean power for buildings that integrate practical power generation systems and graceful architectural forms.

BIPV項目採用BIPV技術，通過安裝光伏瓦屋面、光伏採光頂、光伏幕牆、光伏欄杆、光伏遮陽、光伏車棚等薄膜太陽能系統，利用太陽能資源為建築提供免費的清潔電力，集實用性發電系統和優美的建築形態於一身，構建薄膜太陽能發電建築。

Case: SPIC Headquarters Upgraded to a Smart Energy-Saving Building through BIPV

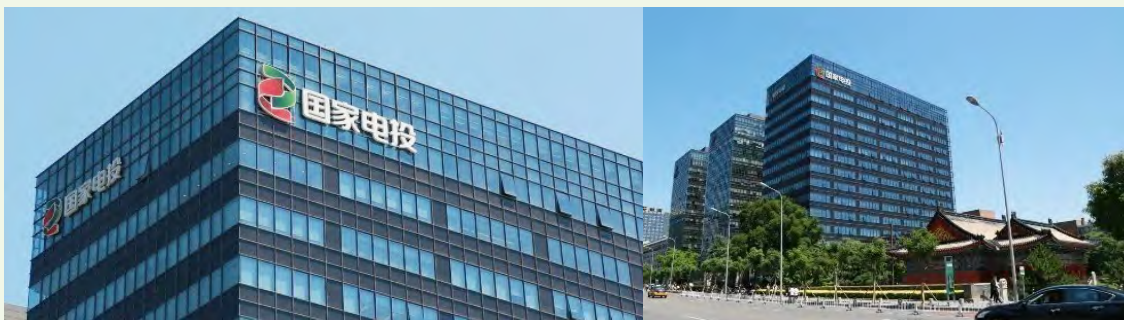
案例：國家電投大樓通過BIPV實現智慧能源大樓的完美升級

On March 27, 2017, the thin-film solar-powered building integration project of the headquarters of the State Power Investment Corporation Limited (referred to as the "SPIC") was officially completed and put into operation. The entire south side of the SPIC Headquarters was transformed into a nice-looking solar wall that can generate electricity. Using components with high sunlight-to-electricity conversion efficiency, the project effectively uses the solar energy irradiated on the surface of the building. By virtue of the material properties of dual-silver-layer low-emissivity glass, it ensures high light transmittance while reducing the heat transfer coefficient by 21%, which reduces largely the indoor temperature and the temperature difference between the north and south sides. It is expected to realize 15% reduction of air-conditioning power consumption.

According to data, the total installed capacity of the photovoltaic curtain wall is 170.66 kilowatts with an average annual power generation of 126,900 kWh in a 25-year period of use which reduces energy consumption of 709,000 kWh.

2017年3月27日，國家電力投資集團有限公司總部大樓（簡稱「國家電投大樓」）薄膜太陽能建築一體化項目實現正式竣工並投產，整個國電投總部大樓南側改造成了既美觀又能發電的太陽能幕牆。該項目使用高光電轉化效率的組件，有效將照射在建築表面的太陽能加以利用，並且憑藉雙銀玻璃的材質特性，保證高透光率的同時將傳熱係數降低21%，充分降低室內溫度，縮小了南北側溫差，預計可實現空調耗電量降低15%。

根據資料表明，國電投辦公樓的光伏幕牆裝機總容量為170.66千瓦，在25年使用期內平均每年發電12.69萬千瓦時，可節約能耗70.9萬千瓦時。



SPIC Headquarters' Photovoltaic Curtain Wall  
國電投大樓光伏幕牆

Case: Goldwind Swimming Pool Achieves Energy Conservation with BIPV Technology  
案例：金風科技游泳池應用BIPV技術實現節能環保

In June 2017, the sunroof thin-film solar-powered building integration project of Xinjiang Goldwind Science and Technology Co., Ltd. Goldwind Science Park Swimming Pool (referred to as "Goldwind Swimming Pool") was officially completed and able to run normally. Using BIPV technology the project paved solar modules on the sunroof of the swimming pool. The available installation area was about 290 square meters and the installed capacity was 19.8 kilowatts. After the installation, the solar energy can be fully converted and utilized, which reduces the intensity of indoor light while powering interior lighting and air conditioners as a supplemental energy source. This design not only maintains the beautiful appearance of the building, but also achieves energy conservation.

2017年6月，新疆金風科技股份有限公司金風科技園內游泳池（簡稱「金風科技游泳池」）採光頂薄膜太陽能建築一體化專案正式完工並正常發電。該項目利用BIPV技術在游泳池採光頂位置安裝鋪設太陽能發電組件，可用安裝面積約為290平方米，裝機容量達到19.8千瓦，將太陽能加以充分利用和轉化，降低室內強光照的同時，作為提供內部照明及空調的補充電源，既保持了建築的美觀外形，又實現了節能環保，一舉兩得。



Solar Lighting Roof of Goldwind Swimming Pool  
金風科技游泳池太陽能採光頂

### 3.1.3. Green Transportation

Hanergy Thin Film Power actively explores green transportation by tapping into the construction of transportation facilities such as integrated intelligent transportation systems that use clean energy and reduce environmental pollution. It is building green and clean transportation facilities in all directions with core technologies. For example, flexible thin-film modules are installed in parking lots, using solar charging piles for power generation and energy storage to provide clean power for automobiles; thin film solar modules are installed at smart bus stations to provide clean power for LED lights and advertising screens; solar roadways are being developed by utilizing the properties of photovoltaic products, such as flexibility, durability, and high conversion efficiency; new energy vehicles that use solar battery modules were launched in conjunction with BAIC and Audi.

### 3.1.3. 綠色交通

漢能薄膜發電在綠色交通領域積極探索，充分發掘使用清潔能源、減少環境污染的交通設施建設，包括建設智慧交通一體化系統，通過核心技術全方位打造綠色清潔交通建設。例如，在停車場安裝柔性薄膜組件，利用太陽能充電樁進行發電和能量存儲，為汽車提供清潔電力能源；在智慧公交車站台裝設薄膜太陽能組件，為LED燈和廣告螢幕提供清潔電力；開發光伏路產品，利用其可彎曲、高效長壽、高轉化效率的特點，打造太陽能發電公路；與北汽、奧迪等車企聯合推出應用太陽能電池組件的新能源汽車等。

#### Case: The First Solar Roadway in China Brings Significant Environmental Benefits 案例：國內第一條光伏路建成帶來顯著環境效益

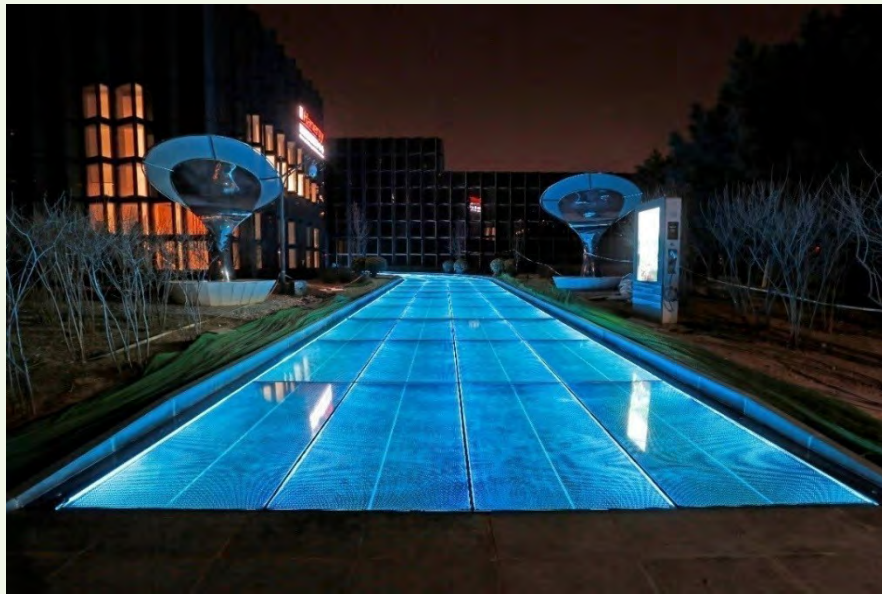
In December 2017, Hanergy Thin Film Power built China's first thin film solar roadway. After the completion of the project, the environmental benefits are significant. Estimated by Beijing's average annual irradiation capacity of 1,362 kWh per square meter, the 10.4-kilowatt solar roadway generated an average of 10,200 kWh of electricity per year. Compared with coal-fired thermal power, it realized annual savings of 3.25 tons of standard coal and reduces CO<sub>2</sub> emissions of about 8.8 tons, sulfur dioxide emissions of about 15 kilograms, nitrogen oxide emissions of about 15 kilograms, and smoke and dust emissions of 4.5 kilograms. The project effectively saved energy while reducing pollutant emissions greatly.

Solar roadways have not only achieved remarkable performance in energy conservation and emission reduction, but also paid great attention to environmental protection in the production of materials. Photovoltaic road blocks are the main components of solar roadways. The production process is non-polluting. The glass edging process uses recycled water throughout. All the scraps after glass cutting are recycled by glass manufacturers for reuse. Packaging and other waste generated in the production process are delivered to qualified partners for harmless disposal.

2017年12月，漢能薄膜發電建成國內第一條薄膜太陽能發電路。此項光伏路項目建成後，帶來的環境效益顯著。按照北京年平均輻照量每平方米1,362千瓦時進行估算，10.4千瓦光伏路年均發電量1.02萬千瓦時，與燃煤火電相比，每年可節約標準煤3.25噸，減少二氧化碳排放量約8.8噸，二氧化硫減排量約15千克，氮氧化物減排量約15千克，煙塵減排量4.5千克，有效節約能源同時極大程度降低污染物排放量。

光伏路不光在節能減排方面成效顯著，在自身材料生產過程中也十分注重環境保護。光伏路塊是光伏路的主要組件，其生產工藝全程無污染，玻璃磨邊過程中全部採用迴圈用水，且玻璃切割後的所有邊角料都有原廠家集中回收進行重複使用；生產過程中產生的產品包裝等廢棄物均交由合資格的合作廠商進行無害化處理。





Solar Roadway at Day and Night  
白天和夜晚的光伏路圖景

Case: Alta Devices Partners with Audi to Launch Thin Film Solar Panoramic Auto Roof  
案例：Alta Devices與奧迪攜手推出薄膜太陽能全景車頂

In August 2017, Alta Devices, a subsidiary of Hanergy Thin Film Power, signed with Audi a strategic memorandum of cooperation on thin film solar cell technology. The two companies will cooperate to launch a thin film solar panoramic car roof which uses car roof solar energy to power seat heating, air conditioning, battery management system and other devices. The thin film flexible solar cell used in this project has a conversion efficiency of more than 25%, and is thin and flexible in application, ensuring sound performance even under low light and high temperature conditions.

The landing of this technology will bring revolutionary green upgrades to cars. In the future, solar cells are very likely to be able to directly power the running of new energy vehicles, reaching a milestone progress in the new energy industry.

2017年8月，漢能薄膜發電子公司Alta Devices與奧迪簽訂薄膜太陽能電池技術戰略合作備忘錄，雙方將合作推出薄膜太陽能全景車頂解決方案，通過車頂太陽能發電為座椅加熱、空調及電池管理系統等設備功能。該項目中應用的薄膜柔性太陽能電池轉化效率超過了25%，並且擁有厚度薄和應用方式靈活的特點，即便在低光照和高溫條件下也能保持良好表現。

這項技術的落地為汽車帶來革命性綠色升級，未來將很有可能實現太陽能電池直接為新能源汽車供能，為車輛續航，為新能源行業帶來里程碑式的進步。



Hanergy and Audi Reached Strategic Cooperation  
漢能與奧迪達成戰略合作



Case: Mobike Shared Bicycles Fitted with Hanergy Thin Film Power Solar Modules to Support Green Life

案例：摩拜共享單車裝上漢能薄膜發電太陽能組件，助力綠色生活

In June 2017, Hanergy Thin Film Power equipped Mobike bicycles with thin film solar modules, setting a model of “Mobile Energy + Internet” innovative cooperation. The first batch of bicycles were loaded with 5.5-watt Hanergy MiaSolé thin film solar module which continuously supplies green energy to the “Beidou + GPS” module and the Internet of Things chip built into the Mobike Smart Lock.

Compared with other photovoltaic modules, Hanergy thin film solar flexible modules are lightweight, flexible, reliable, and safe. They can withstand riding on bumpy roads, bicycles falling, impact from heavy objects and other external forces, while ensuring power supply. In addition, the module has a good weak-electroluminescence effect, which enables operation in the shade or when part of it is covered, effectively converting the solar light into electrical energy.

2017年6月，漢能薄膜發電為摩拜共享單車安裝上了薄膜太陽能發電組件，成為「移動能源+互聯網」創新合作的典範，首批車輛都裝載了5.5瓦的採用漢能MiaSolé技術的薄膜太陽能組件，為摩拜車載智慧鎖中內置的「北斗+GPS」模組和物聯網晶片持續不斷地供應綠色能源。

跟其它光伏組件相比，漢能薄膜太陽能柔性組件具備輕、柔、可靠、安全等特性，可以承受崎嶇路面騎行，車輛摔倒，重物衝擊等外力作用，確保電量供應。此外，該組件還具備良好的弱電發光效應，能夠在樹蔭下或是在組件部分被遮蓋的情況下保持運作，有效地轉化電能。



Mobike Shared Bicycles Fitted with Hanergy Thin Film Power Solar Modules  
安裝漢能薄膜發電太陽能組件的摩拜共用單車

3.1.4. Green Life

With the development of science and technology, the green concept has been integrated into all aspects of life. The Company applies solar power generation to the daily life of urban and rural residents, covering all aspects of smart wear, home life, electronic equipment and outdoor sports gear to meet their growing demand for clean energy.

In February 2017, the Company launched new portable thin film solar energy products, including thin film solar paper, solar backpacks, energy storage lamps, and small-scale off-grid power generation systems. Making full use of the clean, pollution-free and environmentally friendly solar energy, these products can generate power anytime, anywhere. They are mobile power solutions to truly realize energy accessibility everywhere.

3.1.4. 綠色生活

伴隨科技發展，綠色理念已經融入生活的各個方面。漢能薄膜發電將太陽能發電應用到日常生活中，覆蓋到城鄉居民的智慧穿戴、家居生活、電子設備以及戶外運動裝備等方面，滿足日益增長的清潔能源需求。

2017年2月，公司推出了可攜式薄膜太陽能新品，包括太陽能薄膜發電紙、發電背包、儲能燈以及小型離網發電系統，充分利用太陽能清潔無污染、環境友好的特點，隨時隨地提供能源發電，提供移動電源解決方案，真正實現能源的無處不在。

Table: List of Portable Thin Film Solar Electronic Products

表：主要可攜式薄膜太陽能電子產品清單

Products 產品名稱	Description 描述
<div data-bbox="367 1138 622 1573" data-label="Image"> </div> <div data-bbox="316 1642 670 1705" data-label="Caption"> <p>Portable thin film solar backpack 可攜式薄膜太陽能發電背包</p> </div>	<p>The outer layer of backpack is made of nylon and cowhide. The front is a solar sheet using MiaSolé chip, under which there is a pull-out power sheet to increase the light receiving area and improve the power generation efficiency.</p> <p>背包外層由尼龍配以牛皮製成，正面是一張使用 MiaSolé晶片的太陽能發電紙，在其下方還有一張發電紙，可抽拉進行使用，以增大受光面積，提升發電效能。</p>



Thin film solar paper  
薄膜太陽能發電紙

The paper is made of MiaSolé CIGS chip, by which the rate transfer reaches 19.5% in R&D stage and rate of mass production reaches 17.3%. In this series, M12 thin film solar paper adopts a three-fold design, lightweight, thin, soft, waterproof, and stain-resistant. When folded, it's smaller than an A4 sheet with the thickness of only 1 mm. At the same time, there are four hanging buckles to hang the paper on tents and backpacks to generate electricity while walking.

採用MiaSolé的銅銦鎵硒(CIGS)晶片製成，研發轉化率可達到19.5%，量產轉化率為17.3%。其中，M12薄膜太陽能發電紙採取了三折式設計，輕薄、柔軟、防水、抗污，折疊收起時面積小於一張A4紙，厚度只有1毫米。同時額外配備了4枚掛扣，可將發電紙懸掛於帳篷、背包上，邊走邊發電。

### 3.1.5. Green Agriculture

Agriculture is the foundation of socio-economic development. How to achieve a high degree of unification between high-efficiency agricultural development and ecological environment protection is an urgent issue to be solved. As an advocate of clean energy, Hanergy Thin Film Power has gradually applied thin film solar power generation technology to agricultural production. It has realized the rational use of resources and maintained a good ecological environment from the three aspects of photovoltaic poverty alleviation, ecological agriculture construction, and characteristic town planning.

### 3.1.5. 綠色農業

農業是社會經濟發展的基礎，如何將高效的農業發展與生態環境保護進行高度統一是亟待解決的問題。漢能薄膜發電作為清潔能源的宣導者，逐步將太陽能薄膜發電技術推廣應用到農業生產中，從光伏扶貧、生態農業建設、特色小鎮規劃三個方面實現資源合理利用，維護良好的生態環境。

<p>PV Poverty Alleviation 光伏扶貧</p>	<p>The rich solar energy resources in poor areas are fully utilized. Through the development of solar energy resources, stable income is generated for local people, and new energy applications and poverty alleviation are organically combined.</p> <p>充分利用貧困地區太陽能資源豐富的優勢，通過開發太陽能資源，產生穩定收益，將新能源應用與扶貧開發進行有機結合。</p>
<p>Ecological Agriculture 生態農業</p>	<p>Hanergy's modernized agricultural greenhouses are established which adopt integrated solutions to rationally utilize resources and increase the output and quality of crops.</p> <p>建立漢能現代化農業大棚，採用農業大棚一體化解決方案，進行資源合理利用，同時提高農作物的產量和品質。</p>
<p>Characteristic Towns 特色小鎮</p>	<p>Solar energy-themed towns are created. These low-carbon clean towns are developed by applying solar power generation technology in architecture, transportation, landscape, life, and agriculture.</p> <p>建立以太陽能為主題的特色小鎮，在建築、交通、景觀、生活及農業等方面應用太陽能發電技術，構建低碳清潔小鎮。</p>

Case: Hanergy Thin Film Power Launches Photovoltaic Eco-Village Project in Liangzihu District  
案例：漢能薄膜發電開展梁子湖區光伏生態村計劃

Hanergy Thin Film Power joined hands with Liangzihu District in Ezhou City, Hubei Province to launch a photovoltaic eco-village project in Liangzihu District. Combining the local environment and tourism characteristics with the needs of the eco-resort, the project built thin film power stations of different sizes. On the one hand, solar energy is used to provide clean energy for the resort which protects the ecological environment and reduces pollution; on the other hand, the nice-looking appearance of the power stations enhances the ornamental quality. The project plans to build a total scale of 2,240 kilowatts of power plants, distributed in different places to perform corresponding functions:

- One with 180 kilowatts built in the form of a parking shed is located in Donggou Town Aquatic Base to serve as parking and leisure space for fishing tourists;
  - One with 220 kilowatts is located around a crab breeding base in Liangzi Island, Liangzi Town to power the pond's aeration fountains;
  - A 420-kilowatt ground-mounted power station is located on the hillside on both sides of the main road in Zhaoshan Town to serve as a tourist attraction;
  - A ground-mounted power station and parking shed with 540 kilowatts is located around the tourist distribution center in Taihe Town for sightseeing and parking;
  - One with 880 kilowatts built in the form of a corridor and parking shed is located in Tujianao Town to power the eco-village's leisure facilities.
- 東溝鎮水產基地180千瓦，建設形式為車棚，可為垂釣遊客提供停車休閒場所；
  - 梁子鎮梁子島220千瓦，在螃蟹養殖基地周邊建設，為池塘增氧噴泉設施供電；
  - 沼山鎮420千瓦，建設形式為地面電站，在主要道路兩側山坡作為旅遊觀光景點；
  - 太和鎮540千瓦，建設形式為地面電站與車棚，在遊客集散地周邊可供觀賞和停車休閒；
  - 塗家壩鎮880千瓦，建設形式為連廊、車棚，為生態村休閒場所設施供電。





### 3.2. Green Operations

As a high-tech enterprise, Hanergy Thin Film Power has always believed that the coordinated development of the Company's operations and environmental protection is the key to the Company's long-term progress. As the Company's direct impact on the environment is relatively small, we take green operation as our primary task of environmental protection. We actively practice energy conservation, emission reduction, and low-carbon development from product R&D, technology innovation to production in a bid to realize green operation in all aspects such as the use of energy resources, emissions and waste management, etc.

#### 3.2.1. Use of Energy and Resources

The Company strictly abides by the *Environmental Protection Law of the People's Republic of China* and relevant laws, regulations and systems in the regions where it operates. It formulated such regulations as *Vehicle Management System* and *Management System for Office Supplies* to regulate the use of resources and energy resources, encourage the conservation of energy resources, and strengthen employees' awareness of energy conservation. The Company has achieved sustainable development through energy resource reuse and energy-saving transformation in its operations.

As a high-tech new energy company, the Company's main businesses include the R&D, design, sales and delivery of thin film solar module production equipment and production lines, as well as distributed photovoltaic and mobile energy solutions, but do not involve product production and manufacturing. Therefore, the energy sources we use in our operations are mainly water, electricity, and paper.

### 3.2. 實踐綠色運營

作為高新技術企業，漢能薄膜發電始終堅信企業運營與環境保護協同發展才是企業長足進步的關鍵。由於公司對環境造成的直接影響較小，因此我們將綠色運營作為環境保護的首要任務，從產品研發、技術創新到生產運營積極實踐節能減排、低碳發展，在能源資源使用、排放物及廢棄物管理等方面全面實現綠色運營。

#### 3.2.1. 能源資源使用

公司遵循《中華人民共和國環境保護法》及運營地區的相關法律、法規和制度，制定《車輛管理制度》、《辦公物資管理制度》等章程，對資源能源使用進行規範化管理，鼓勵能源資源節約，強化員工節能意識，通過在公司運營及日常辦公中推行能源資源重複利用、節能改造等方式，實現可持續發展。

公司作為高科技新能源企業，主要業務包括薄膜太陽能組件生產裝備及生產線的研發、設計、銷售及交付，以及分佈式光伏及移動能源解決方案，不涉及產品的生產和製造。因此在日常運營中公司主要涉及的資源能源為水、電、紙張。



Case: Hanergy Thin Film Power Uses Clean Solar Energy for Power Generation  
 案例：漢能薄膜發電使用清潔太陽能發電

Hanergy Thin Film Power adheres to the three-level energy efficiency concept of “self-generation for self-use, surplus energy storage, and residual power connected to grid”. The Company adopts the thin-film solar-powered building integration technology at its exhibition center by installing thin film solar modules with a total installed capacity of 270 kilowatts. Our self-developed intelligent micro-grid management system is also used to realize intelligent management and optimal operation of power self-generation, self-use, storage, and sales, and in the meantime, energy connectivity and sharing with the headquarters. Thus, an energy-saving building is created, effectively reducing energy consumption. In 2017, the total power saved was approximately 87,000 kWh.

漢能薄膜發電秉持「自發自用、盈餘儲能、餘電上網」的三級能效理念，在展示中心實施薄膜發電建築一體化技術，安裝薄膜太陽能發電組件，總裝機容量達270千瓦；並且採用了我們自主研發的智慧微網管理系統，在實現自身發電、用電、儲電、售電智慧化管理和最優化運行的同時，可與總部進行能源互聯和共用，實現節能建築，有效降低了能源使用，2017年共計節省電力約8.7萬度。

Table: The Company’s energy and resource consumption and carbon emissions in 2017  
 表：2017年公司各類能源資源使用及碳排放情況

Comprehensive energy consumption (tons of standard coal) 綜合能源消耗量(噸標煤)	5,461.96
Comprehensive energy consumption per HKD10,000 of revenue (tons of standard coal) 萬港元營收綜合能耗(噸標煤)	0.0089
CO <sub>2</sub> e emissions (tons) 二氧化碳排放當量(噸)	25,470.75
Direct emissions (Scope I) (tons) 其中：直接排放當量(範疇一)(噸)	1,824.8
Indirect emissions (Scope II) (tons) 其中：間接排放當量(範疇二)(噸)	23,645.95
CO <sub>2</sub> e emissions per HKD10,000 of revenue (tons) 萬港元營收二氧化碳排放當量(噸)	0.041
Total consumption of purchased electricity (kWh) 外購電力消耗總量(千瓦時)	35,580,194.87
Vehicle gasoline consumption (L) 車輛汽油使用量(升)	78,470.83

Diesel consumption (L) 柴油使用量(升)	8,005.835
Use of nature gas (m <sup>3</sup> ) 天然氣使用量(立方米)	747,069.38
Generation of solar power for self-use (kWh) 自用太陽能發電量(千瓦時)	1,310,998
Total water consumption (tons) 總耗水量(噸)	96,471.31
Municipal water supply (tons) 其中：市政供水量(噸)	96,437.45
Reclaimed water (tons) 其中：中水量(噸)	25.1
Water consumption per HKD10,000 of revenue (tons) 萬港元營收耗水量(噸)	0.157

Solibro, a subsidiary of Hanergy Thin Film Power, established rules and regulations for the rational use of water and electricity. Employees are required to use reusable utensils such as teacups in meetings and group activities to reduce the use of disposable bottled drinking water. Posters reading "Save Water" are posted in washrooms to raise employees' awareness of saving. Energy-saving devices such as LED energy-saving lamps are used to reduce resources. Employees are also required to turn off power immediately after work. Paperless office is promoted by using double-sided printing as much as possible and periodically recycling reusable paper.

Global Solar Energy (GSE), another subsidiary of Hanergy Thin Film Power, installed a frequency converter in the chilled water system to effectively reduce the amount of electricity used. A strainer made of insulating paper was installed in the heat ventilation and air conditioning system to increase the strainer's service life and efficiency and reduce energy waste. An acid control device for sulfuric acid was installed in the cooling tower to increase the efficiency of the cooling tower and reduce water consumption. An automatic flushing device was installed in the urinal to reduce water waste.

漢能薄膜發電子公司Solibro建立合理用水用電規章制度，要求員工在組織會議和集體活動時儘量使用茶杯等可循環使用的器具，減少使用一次性瓶裝飲用水；在洗手間張貼「節約用水」等宣傳標語，提高員工節約意識；使用LED節能燈等節能設備，減少資源浪費；要求員工下班後及時關閉電源；提倡無紙化辦公，儘量採用雙面列印，定期整理回收可再利用的紙張。

漢能薄膜發電子公司Global Solar Energy (GSE)在冷凍水系統安裝了變頻器，有效降低了用電量；在供熱通風與空氣調節系統安裝了用絕緣紙製成的濾網，以增加濾網的使用壽命和效率，減少能源浪費；在冷卻塔安裝了硫酸酸性控制裝置，以提高冷卻塔的效率，同時降低用水量；在廁所小便池安裝了自動沖洗裝置，以減少水資源浪費。

### 3.2.2. Emissions and Waste Management

The Company strictly abides by the relevant laws and regulations such as the *Air Pollution Prevention Law of the People's Republic of China*, the *Water Pollution Prevention Law of the People's Republic of China*, and the *Solid Waste Pollution Prevention Law of the People's Republic of China*. It has improved the relevant management systems and defined management objectives for controlling emissions generated and standardizing waste management.

At present, the Company's business focuses on the R&D, design, sales, and delivery of thin film solar cells and the provision of solutions, not involving production and manufacturing of mass-produced products. Therefore, our emissions mainly come from the use of a small amount of chemical products during the R&D process and energy consumption mainly from daily office work. Our emissions mainly include small amounts of dust, wastewater, and wastes.

The small amount of dust generated during the R&D process is discharged after compliant treatment, and the discharge fully meets the national emission standards. The Company produced a total of 0.1 tons of dust emissions throughout the year.

Wastewater mainly comes from R&D, production and daily lives. For wastewater from production, the Company treats it in compliance with relevant regulations to meet the national emission standards. For example, GSE periodically samples and analyzes the production wastewater, monitors its parameters including pH, COD, suspended solids, metal content and conductivity, and treats it using neutralization, chemical precipitation, chemical redox, and electrolysis, etc. so that it meets the emission standards. In this year, the Company produced 15,902.8 tons of waste water, 0.0256 tons of suspended solids, 0.46 tons of COD, and 6.18 tons of ammonia nitrogen emission. Domestic wastewater is discharged to a sewage treatment plant for compliance discharge.

### 3.2.2. 排放物及廢棄物管理

公司嚴格遵守《中華人民共和國大氣污染防治法》、《中華人民共和國水污染防治法》、《中華人民共和國固體廢物污染環境防治法》等國家相關法律法規，完善相關管理制度，明確管理目標，控制排放物產生量，規範廢棄物管理。

目前公司業務主要集中在薄膜太陽能電池組件研發、設計、銷售、交付以及提供解決方案，不涉及批量產品的生產與製造，因此排放物的產生主要來源於研發過程中少量的化學產品使用以及日常辦公過程中的資源能源消耗。排放物主要包括少量粉塵、廢水以及廢棄物。

研發過程中產生的少量粉塵都經過合規處理進行排放，充分滿足國家排放標準。公司全年粉塵排放量共計0.1噸。

廢水主要來源於研發生產用水和生活用水。對於生產廢水，公司會進行合規處理以達到國家排放標準，例如GSE會定期對生產廢水進行取樣分析，監測其pH值，COD，懸浮物，金屬含量及電導率等參數，並利用中和、化學沉澱、藥劑氧化還原和電解等方法對廢水進行處理，使其達到排放標準。本年度，公司產生的廢水量共計15,902.8噸，懸浮物總量0.0256噸，化學需氧量排放總量為0.46噸，氨氮排放量為6.18噸。生活廢水統一排放到水處理站進行合規排放。

Types of waste mainly include office and domestic waste, and hazardous waste generated during R&D such as chemical products. The office and domestic waste mainly includes paper, used office furniture, used toner cartridges, and waste tubes. They are mainly recycled, and recyclable waste paper and office furniture is reused. Other waste is regularly disposed of by environmental sanitation companies. In the second half of this year, the Company reused unused office furniture, totaling more than 700 pieces of old desks, filing cabinets, office chairs, and so on, saving more than RMB300,000. For hazardous waste, the Company implements classified management and centralized disposal to achieve reduction, recycling, and harmlessness of hazardous waste. It regularly delivers the collected hazardous waste to a qualified supplier for unified treatment to avoid environmental pollution. In this year, the Company produced a total of 121.39 tons of solid hazardous waste and 130.81 tons of liquid waste; the waste produced per HKD10,000 of revenue was 0.00041 tons.

廢棄物主要包括辦公及生活垃圾以及研發生產過程中產生的化學用品等危險廢棄物。辦公及生活垃圾主要包括紙張、廢舊辦公傢俱、廢舊硒鼓、廢舊燈管等，以回收為主，對於可回收的廢紙、辦公傢俱等進行再次利用，其他廢棄物均定期交由環衛公司進行處理。今年下半年，公司對閒置辦公傢俱進行重複利用，共計利舊辦公桌、文件櫃、工作椅等700餘件，節省費用超過30萬元人民幣。對危險廢棄物，公司實行分類管理，集中處置，實現危險廢物的減量化、資源化和無害化，定期將收集的危險廢物交給合資格的合合作廠商統一處理，避免環境污染。本年度，公司共產生固體危險廢棄物121.39噸，廢液130.81噸，每10,000港元營收之廢棄物產生量為0.00041噸。

Table: The Company's Office and Domestic Waste Disposal in 2017

表：2017年公司辦公及生活垃圾處理情況

Paper use (tons) 紙張使用量(噸)	18.872
Waste office furniture (tons) 廢舊辦公傢俱產生量(噸)	0.35
Waste toner cartridge (tons) 廢舊硒鼓產生量(噸)	0.242
Waste tubes (tons) 廢舊光管產生量(噸)	0.664
Waste electronic products (tons) 廢舊電子產品產生量(噸)	0.995

## 4. Value to Share: Innovation and Cooperation

Technological innovation is one of the Company's core responsibilities. We are committed to "change the world with thin-film solar" by consistently investing in innovation and cooperation to maintain our leading position in the thin film solar energy industry.

### 4.1. Strengthening Technological Innovation

As a global leader in the thin film solar industry, Hanergy Thin Film Power has made efforts across the industrial chain from upstream equipment, midstream production, to downstream products, and has initially formed its own matrix of products and applications. Transformation and innovation are the cultural genes of Hanergy Thin Film Power. Focused on innovation of technologies and applications, we implement intellectual property management in a concrete manner, actively participate in discussions on industry standards, among other things, to constantly refresh the world record of module efficiency and maintain our leading position in the field of thin film solar power generation.

#### 4.1.1. Enhancing R&D and Innovative Achievement

Continuous technological innovation is the cornerstone and way for us to achieve sustainable development. We set great store by introduction and training of R&D and technical talents. We established the Global Application Products Development Center which adopts IPD process to manage product development throughout the life cycle. We established a global R&D team led by top-level scientists in the semiconductor and photovoltaic industry at home and abroad. Our team mainly consists of overseas returning young and middle-aged scientists. In 2017, our investment in R&D amounted to HKD621.678 million.

In the past year, we continued to strengthen technological innovation, develop new products, and explore new business models to expand core business. In response to the enthusiasm across China for developing new energy industrial parks, we actively launched turnkey solutions and large-scale localization of thin film solar module production equipment and production lines. We developed key photovoltaic applications such as downstream distributed generation channel sales, industrial and commercial power generation, photovoltaic poverty alleviation, BIPV, and mobile energy.

## 4. 共用價值：我們的創新與合作

技術創新是企業的核心責任之一，我們致力於「用薄膜太陽能改變世界」，持續不斷地在創新和合作領域投入，以保持我們在薄膜太陽能產業的領導者地位。

### 4.1. 加強技術創新

作為全球薄膜太陽行業的領導者，漢能薄膜發電在上游裝備、中游生產和下游產品領域全面發力，已初步形成了自己的產品及應用之矩陣。變革與創新是漢能薄膜發電的文化基因，通過重點關注技術創新和應用場景創新，紮實實行知識產權管理，積極參與行業標準討論等，不斷刷新組件效率世界紀錄，保持我們在薄膜太陽能發電領域的世界領先地位。

#### 4.1.1. 增強研發實力，豐富創新成果

堅持技術創新，是我們實現可持續發展的基石和途徑。我們十分注重科技研發和技術人才的引進和培養，通過成立全球應用產品研發總部和採用IPD流程等方式，對產品的開發進行全生命週期管理。我們組建了由國內外半導體和光伏產業頂級科學家領銜，以歸國中青年科學家為骨幹的全球化研發團隊。2017年，我們的研發投放資金累計為621.678百萬港元。

過去一年來，我們繼續不斷加強技術創新、開發新產品、探索新商業模式，開拓發展核心業務；配合中國各地大力發展新能源產業園的經濟趨勢，積極推動開展薄膜太陽能組件生產裝備產線的交鑰匙工程及大規模國產化；開發下游分佈式發電渠道銷售、工商業發電、光伏扶貧、BIPV、移動能源等重點光伏應用業務。



We are also continuing to seek breakthroughs in the application of thin film solar cells in such fields as construction, transportation, and portable mobile energy products. We apply the advanced green design concept in the construction of bridges, buildings, water systems, agriculture, municipal facilities, etc. We have also applied thin film solar cells in a number of mobile transportation areas. Various means of transportation such as solar-powered ships, shared bicycles, solar vehicles, drones, etc. have enjoyed the green and uninterrupted power supply from installation of thin film solar cells. We also introduced a new generation of portable mobile energy products such as solar paper, solar bags, solar backpacks, and small off-grid power generation systems to provide users with more convenient and faster mobile power experience and to meet the demand for mobile energy solutions from mobile communications, outdoor sports, field operations, emergency rescue and other markets.

我們也在持續尋求薄膜太陽能電池在建築、交通、可攜式移動能源產品等領域的應用場景突破。我們將先進綠色設計理念應用在橋樑、建築、水系統、農業、市政等城市建設中。同時，我們將薄膜太陽能電池相繼應用於多個移動交通領域，從全太陽能動力船、共享單車到太陽能汽車、無人機等各種交通工具，都因安裝薄膜太陽能電池而得以享受綠色、不間斷的電力。我們還推出新一代太陽能薄膜發電紙、發電包、發電背包、小型離網發電系統等多款可攜式移動能源產品，為使用者提供更方便、快捷的移動用電體驗，滿足移動通訊、戶外運動、野外作業、應急救援等市場對移動能源解決方案的需求。

#### Hanergy Thin Film Power Holds Four World Records in Thin Film Solar Energy Industry 漢能薄膜發電在薄膜太陽能領域擁有四項世界紀錄

- The efficiency of mass production with gallium arsenide (GaAs) technology from Alta Devices, a US subsidiary of the Company reached 25.1%;
- The maximum conversion rate of GaAs single-junction cells from Alta Devices, a US subsidiary of the Company reached 28.8%;
- The efficiency of mass production of winner modules (AA) with MiaSolé new-generation process reached 17.4%, which currently represents the highest efficiency in the world for sputtering CIGS flexible modules;
- The efficiency of mass production of winner modules (AA) from Solibro, the German subsidiary of the Company reached 18.72%, which is the world record for the mass production of co-evaporation CIGS modules.
- 美國子公司Alta Devices的砷化鎵 (GaAs)技術量產組件效率25.1%；
- 美國子公司Alta Devices的砷化鎵 (GaAs)技術單結電池最高轉換率28.8%；
- MiaSolé新一代工藝量產冠軍組件 (AA)效率達到17.4%，為全球濺射法銅銻鎵硒(CIGS)柔性組建的世界紀錄；
- 德國子公司Solibro量產冠軍組件 (AA)效率達到18.72%，為共蒸法CIGS組件量產世界紀錄。

The Efficiency of Hanergy Thin Film Power Generation Components Reached New Heights in 2017  
2017年漢能薄膜發電組件效率再創新高

- The conversion efficiency of the effective area of Solibro CIGS glass-based modules increased from 17.1% in 2016 to 18.72%;
- The conversion efficiency of MiaSolé CIGS flexible modules reached 17.4%;
- The efficiency of mass production of GaAs single-junction modules reached 25.1%;
- The lab efficiency of high-efficiency silicon heterojunction (SHJ) cells also reached 23.05% and was certified by German Fraunhofer Society.
- 銅銦鎵硒Solibro玻璃基組件的有效面積轉換效率從2016年的17.1%提升至18.72%；
- 銅銦鎵硒MiaSolé柔性組件的轉換效率達到17.4%；
- 砷化鎵單結組件效率達到25.1%；
- 高效矽異質結SHJ電池研發效率也高達23.05%，並已獲得德國Fraunhofer認證。

#### 4.1.2. Protecting Intellectual Property and Promoting Industry Development

Intellectual property rights are the guarantee of the Company's core competitiveness. As a company that controls the world's leading technologies in the thin film solar power generation industry, Hanergy Thin Film Power values highly the management and maintenance of intellectual property and innovation outcomes. In order to further standardize and systematize its management of patent applications and improve the efficiency of patent application, the Company in 2017 formulated intellectual property management specifications and specific operating rules such as the *Intellectual Property Management System*, *Patent Management System* and *Administrative Measures for Patent Application Process*, etc., so that the Company's patent management has rules to follow. In order to improve the Company's management of intangible assets, we also issued such management documents as the *Trademark Management System* and *Instructions of Software Copyright Registration Process* to standardize the management of intellectual property such as trademarks and copyrights.

In addition, based on the Company's five-year plan and strategy, we formulated a five-year strategic plan for corresponding work on intellectual property and standards, including personnel planning, intellectual property business planning, etc., to assist the Company in achieving global strategic deployment with intellectual property rights.

#### 4.1.2. 保護知識產權，助推行業發展

知識產權是企業核心競爭力的保障。作為一家太陽能薄膜發電行業掌握世界領先技術的公司，漢能薄膜發電高度重視對於知識產權和創新成果的管理和維護。為進一步實現漢能薄膜發電專利申請管理工作的規範化、系統化，提高專利申請效率，2017年公司制定了《知識產權管理制度》、《專利管理制度》、《專利申請流程管理辦法》等整體管理規範和具體操作規範，使公司的專利管理工作有章可循。為提高公司對無形資產的管理水準，我們發佈了《商標管理制度》、《軟件著作權登記流程說明》等管理檔，規範化了對商標、著作權等知識產權的管理。

此外，圍繞公司的5年規劃和戰略，我們制定了相應的知識產權和標準工作的5年戰略規劃，包括人員規劃、知識產權業務規劃等，以知識產權助力公司實現全球戰略部署。

4.2. Assuring Superior Quality

Our core value is “to focus on our customers”, and our goal is to provide them with the best products, service and experience. We strengthen product quality control and offer valuable products and services to our customers based on their needs.

4.2.1. Quality Control

Hanergy Thin Film Power has been regarding the product quality as its lifeline. We keep attaching great importance to products’ quality, reliability, durability and compliance with standards so as to ensure the long-term and effective operations of our internal quality system. By establishing the Hanergy Process Management Framework, we standardized our management process, core business process and workflow process of the support department and so on. Focusing on four dimensions i.e. product quality, process, services and employees, we carry out the quality control and process management work in a systematic and comprehensive way.

4.2. 保證優良品質

「以客戶為核心」是我們的核心理念，為客戶提供最好的產品、最好的服務和最好的體驗是我們的目標。我們加強產品品質管制，以客戶需求為導向，為客戶提供有價值的產品與服務。

4.2.1. 品質管制

漢能薄膜發電一直把產品品質視作企業的生命線，持續關注產品的品質、可靠性、耐久性以及標準符合性，確保企業內部品質體系運作持續和有效。我們建立了「漢能流程管理架構」，對公司的管理流程、核心業務流程、支援部門工作流程等進行標準化、規範化管理。不限於產品品質本身，我們所有的品質標準均圍繞著產品、過程、服務、人員品質四個維度，全面系統地開展公司的品質和流程管理工作。

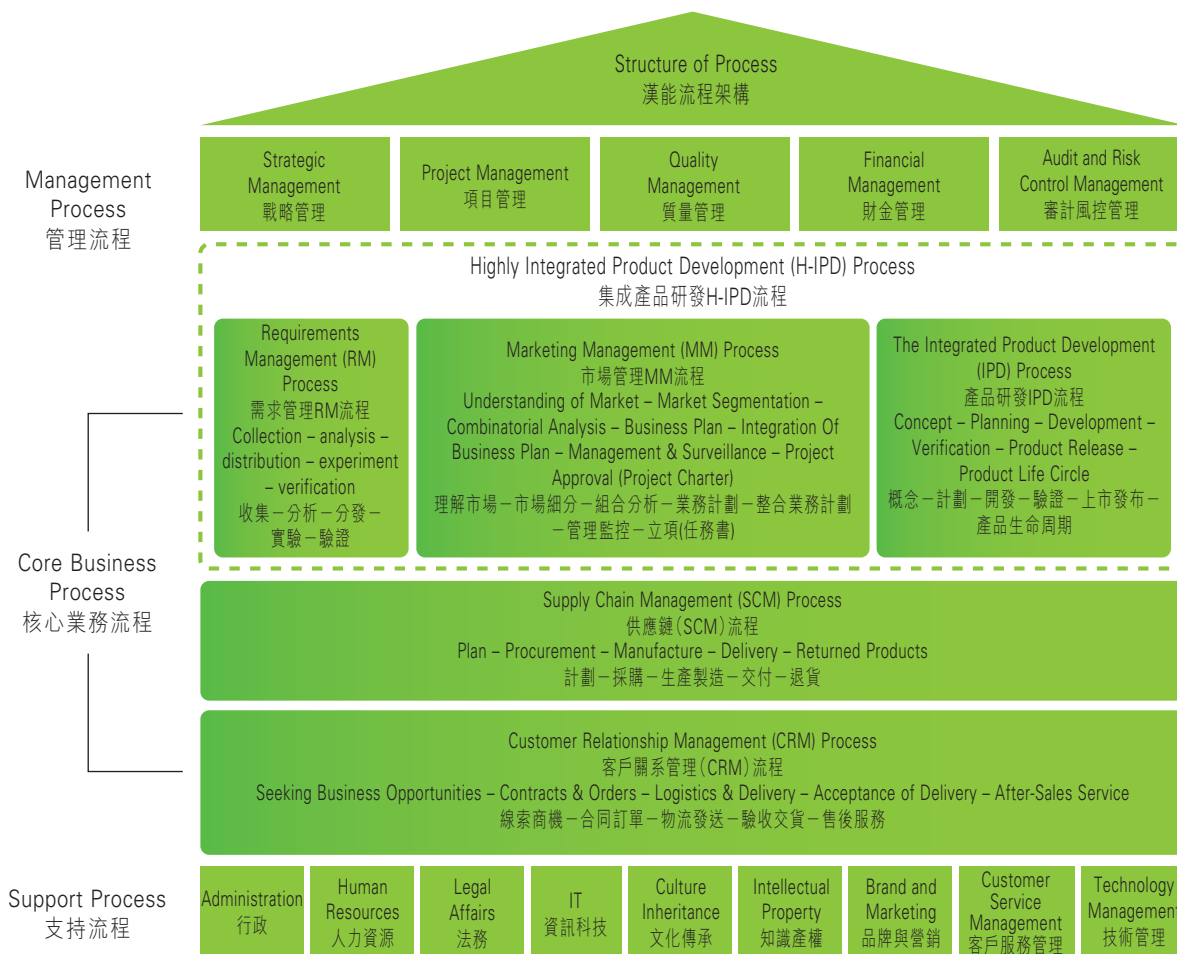


Diagram of All Business Process of Hanergy Thin Film Power (HOP Process)  
漢能薄膜發電全業務流程圖 (HOP流程屋)

---

In order to take control of the quality and ensure that customers can enjoy services and products with high quality, Hanergy Thin Film Power formulated the *One-Vote Veto Management System on Quality* and granted our quality control staff one-vote veto right. With all these efforts, we could identify in advance quality problems including poor quality of products, potential risks of poor quality, safety hazards in health, property and environment, and violation of national laws and regulations, and timely put them under control to prevent their harmful effect from being expanded. For those projects that are necessary to actuate one-vote veto after evaluation, they must pause their operations first. Problems analysis and formulation of solutions should be carried out. The work of problem-solving solutions should be completed within 72 hours after one-vote veto mechanism was actuated. The problem-solving solutions will be end only when the effect of the solutions is confirmed by the Quality Control Department of the Group. The department also need to decide whether preventive measures should be taken or not.

In 2017, the Company's on-time delivery was 94%, and its qualification rate of first delivery was as high as 99.4%. No any major quality accidents occurred in this year.

為確保對品質問題進行有效控制，保證為客戶提供的產品和服務品質，漢能薄膜發電制定《品質一票叫停管理制度》，授予品質人員一票叫停權，將涉及不良或存在不良隱患，重大人身、財產、環境安全，以及違反國家法律法規的品質問題在出現的前期進行識別與控制，防止不良影響進一步擴大。對於經評估後判定需啟動一票叫停的項目，叫停對象須立即停止叫停內容；並對問題進行初步分析，擬定相應解決方案，問題解決方案的制定工作須在機制啟動後72小時內完成，問題解決方案的執行效果經集團品質管制部門確認後方可執行問題終止，並評定是否需開展相應預防措施的制定。

2017年，漢能薄膜發電按時交付率為94%，產品一次交付合格率为99.4%，未發生重大品質事故。

Case: Hanergy Thin Film Power Won the First ISO 9001 Certificate for the whole group in Thin Film Power Industry

案例：漢能薄膜發電獲得薄膜行業全球第一張集團化認證ISO 9001證書

In 2017, Hanergy Thin Film Power led the thin film industry in introducing and establishing the quality control system for both parent company and its subsidiaries. In March 2018, together with its subsidiary companies such as Beijing Hanergy Household Thin Film Power Technology Co., Ltd (Channel Sales Business Unit) and Beijing Hanergy Thin Film Power System Integration Technology Co., Ltd (Key Account Business Unit), Hanergy Thin Film Power Group Limited was successfully certificated by the ISO 9001: 2015 Quality Management Systems after one-year operations. It was the first ISO 9001: 2015 Quality Management Systems Certificate for the whole group in the thin film industry. It showed that the Company already met international standards in integrating various management systems and embarked on a road of standardization management.

2017年，漢能薄膜發電在行業內率先引入集團化（子母認證）品質管制體系構建。經過近一年的運行實施，2018年3月漢能薄膜發電及其子公司北京漢能戶用薄膜發電科技有限公司（渠道銷售事業部）和北京漢能薄膜發電系統集成技術有限公司（大客戶事業部）順利通過ISO 9001:2015品質管制體系認證。此認證為薄膜行業全球第一張集團化認證（子母認證）ISO 9001:2015品質管制體系證書。此次認證的通過，說明漢能薄膜發電在各項管理系統整合上已完全達到了國際標準，走上了規範化、標準化的道路。

#### 4.2.2. Providing Customers with Good Service

Being dedicated to providing customers with products and services of high quality, Hanergy Thin Film Power actively put its value of "taking customer's value as the core" into the practice and daily work. Benefited from its the powerful technical team and rich program experiences in providing solutions, the Company discusses and communicates with customers in terms of project features and their demands so that the satisfying solutions can be worked out.

In addition, the Company value customer privacy by strictly restricting the use of related information and ensuring the security of information.

#### 4.2.2. 為客戶提供優質服務

漢能薄膜發電致力於為客戶提供優質的產品和服務，切實將「以客戶價值為核心價值」的價值觀融入到實際工作中。漢能薄膜發電依靠強大的技術團隊和豐富的提供解決方案的項目經驗，針對項目特點和客戶需求，反復與客戶共同討論，確保提出令客戶滿意的解決方案。

此外，公司重視客戶的信息隱私，嚴格控制相關方信息使用範圍，確保客戶信息不會被泄露。



### Case: A Customized Building Integrated Photovoltaic Solution for the Inner Mongolia Natural History Museum

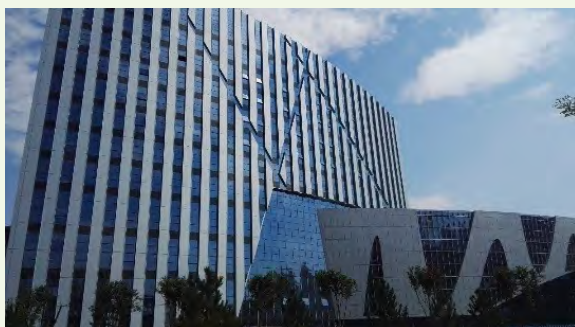
案例：為內蒙古自然歷史博物館提供定制化的薄膜太陽能建築一體化解決方案

As the landmark building of Hohhot City, the Building Integrated Photovoltaic project of Inner Mongolia Museum of Natural History is in line with the national strategy of energy conservation. Combining power generation and energy conservation, it is a sample project of integrated photovoltaic building in Inner Mongolia.

The integrated solar photovoltaic building of Inner Mongolia Natural History Museum is an important project in Inner Mongolia. At the very start of the project, proprietors and design institutes were worried that the solar photovoltaic glasses modules may cause bad effect to the external facade and solar photovoltaic glass curtain wall may have a high damage rate. They also doubted the necessity to install the solar photovoltaic glasses at the external facade. Besides, the consultant company on solar photovoltaic glass curtain wall also worried that the addition of solar power system may impact the original curtain wall plan. In order to tackle the difficulties of the project and the concern of different parties, Hanergy Thin Film Power founded a Strong Matrix Project Team. The team came up with seven plans successively after repeated discussion and revisal and finally solved all technical problems with recognitions from all sides. Meanwhile, in order to meet the building standards, the Company completed a customized improvement in technology of solar photovoltaic glass modules, by which the project realized the goal of zero broken rates since installment and laid a solid foundation for applying the Company's thin-film solar products to the buildings.

作為呼和浩特市地標建築，內蒙古自然歷史博物館薄膜太陽能建築一體化項目的建築符合國家節約能源戰略，融合了被動式節能與主動式發電，是內蒙古太陽能建築一體化樣板工程。

作為當地重點計劃，建設初期業主、設計院等均擔心安裝太陽能玻璃組件可能影響外立面效果，普通光伏玻璃幕牆組件破碎率高，且對在立面安裝的必要性存疑。幕牆顧問公司擔心增加太陽能發電系統可能影響原幕牆系統方案。針對計劃難點和各方提出的疑慮，漢能薄膜發電組建強矩陣項目團隊，經多次溝通，反復調整，前後共作出7版解決方案，逐一解決了各方提出的技術問題並得到認可。同時，為符合建築標準要求，公司對組件工藝進行定制化改進，實現了此項目從安裝完成至今零破碎的目標，為漢能薄膜太陽能產品應用到建築上奠定了堅實基礎。



The Building Integrated Photovoltaic Project of Inner Mongolia Museum of Natural History  
蒙古自然歷史博物館薄膜太陽能建築一體化項目

### 4.2.3. Customer Complaint Management

To ensure that each complaint is properly handled and customer requirement is met in a timely manner, the Company has set up a user call center to handle customer complaints and a management process that meets its own needs. At the same time, it holds business communication meetings with key customers to enhance communication and exchange.

### 4.2.3. 客戶投訴管理

為確保每宗投訴得到及時妥善處理，及時滿足客戶要求，公司針對客戶投訴設立了使用者呼叫中心、搭建了符合自身需求的管理流程。同時，通過舉辦大客戶業務溝通會增強與客戶之間的溝通和交流。

#### Case: Management of Customer Complaints by Channel Sales Business Unit of Hanergy Thin Film Power

案例：漢能薄膜發電渠道銷售部對於客戶投訴的管理

The Channel Sales Business Unit formulated the *Procedures for Information Operation and Management of the User Call Center* to ensure the smooth flow of information and smooth operation and management of the call center. This prevents information backlog and improper handling and avoids customer loss due to untimely or improper information processing. After receiving a customer complaint, the call center assigns the complaint to a related business department or after-sales management department at the provincial level. After verifying the details with the customer, the provincial branch appoints an after-sales service provider to solve the problem for the customer. For major complaints, service upgrade will be offered to ensure that customer issues are resolved.

漢能薄膜發電渠道銷售事業部制定《使用者呼叫中心資訊運營管理流程》，以保障呼叫中心資訊流轉順暢、運營管理暢通，防止資訊積壓及不當處理，避免因資訊處理不及時不適當而導致的終端客戶流失。呼叫中心接收到客戶投訴後將派發至省公司的相關業務部門或售後管理部門，省公司在與客戶核實意向詳情後將指派售後服務商為客戶解決問題。對於重大投訴，將予以服務升級，確保客戶問題得到解決。

In 2017, the Channel Sales Business Unit received a total of five complaints filed with the Industrial and Commercial Administrative Office and had no incidents exposed by media. During the reporting period, all of the abovementioned five complaints were properly handled. In addition, the E-Commerce Business Unit received eight online customer complaints from T-Mall and had properly handled these complaints.

2017年，渠道銷售事業部共發生了5宗起投訴到工商所的投訴，無媒體曝光事件。截至報告期間，5宗投訴均已處理完畢。此外，電商事業部接到8次天貓線上客戶投訴，均已得到妥善處理。

### 4.3. Supply Chain Management

We pay sustained attention to the environmental and social risks and sustainable development ability of our suppliers and distributors. We also consistently enhance the overall social responsibility of the supply chain through such activities as audits and capacity building.

Hanergy Thin Film Power has formulated *Bidding Management Measures*, *Procurement Management System*, *Supplier Management Measures*, *Supplier Selection Measures*, and other related systems. These systems regulate the selection of suppliers for all types of procurement by which the Company to provide fair and just competition among all suppliers. The *Quality Management System for Suppliers' Product Development (Trial)* was established to regulate the quality of products and services provided by suppliers, their supporting service capabilities, as well as work processes and responsibilities, etc., offering guidance for suppliers to develop product development quality systems in line with the requirements of Hanergy Thin Film Power.

We have established a one-vote negation system applying to all authorized distributors nationwide to enhance the service awareness, and to improve the service capabilities and service management. We will terminate agreements with distributors who have violated commercial reputation and anti-corruption clauses, who have been assessed twice as Grade-D, and who have seriously damaged the interests of users and Hanergy's reputation.

We conduct on-site inspections of suppliers. By planning for supplier inspection and evaluation and preparing reports on on-site supplier inspection and evaluation, we provide clear guidance on the specific operations of suppliers in practical work. We also hold regular conferences with suppliers and distributors to communicate the latest requirements and standards of Hanergy Thin Film Power. By regularly evaluating and analyzing suppliers' capabilities and helping them with capacity building, we extend social responsibility to the management level of supplies in a concrete manner so as to enhance the sustainable development across the supply chain. In 2017, we evaluated and analyzed the capabilities of suppliers of power station materials, R&D and production materials, and non-core equipment from the dimensions of technology, procurement, and quality.

As of December 31, 2017, we had a total of 75 midstream suppliers and 35 downstream suppliers in the supply chain.

### 4.3. 供應鏈管理

我們持續關注供應商和經銷商的環境、社會風險和可持續發展能力，並通過開展審核和能力建設等活動，不斷提升供應鏈整體的社會責任水準。

漢能薄膜發電制定《招標管理辦法》、《採購管理制度》、《供應商管理辦法》、《供應商選擇辦法》等相關制度，對全公司各類採購業務供應商選擇的行為進行規範，為所有供應商提供公平、公正的競爭機會。我們制定《供應商產品開發品質管制制度（試行）》，以規範供應商提供的產品和服務品質水準、配套服務能力，以及工作流程和職責等，並為供應商建立符合漢能薄膜發電要求的產品開發品質體系提供指導。

我們制定了覆蓋全國授權經銷商的服務一票否決制度，以加強經銷商的服務意識，提升經銷商的服務管理水準與服務能力。此外，我們將與發生違反商業信譽及反腐敗條款、連續2次考核為D級、嚴重損害用戶利益並導致漢能信譽受損等情況的經銷商終止協定。

我們對供應商進行現場考察，通過制定供應商考察評估計劃、整理編制供應商現場考察評估報告等方式，對供應商實際工作中的具體操作進行明確指導。我們定期舉辦供應商和經銷商大會，向供應商、經銷商傳達和溝通漢能薄膜發電的最新要求和標準；定期對供應商進行能力評價分析並為其提供能力建設，切實地將社會責任延伸到供應商的管理層面，以提高供應鏈整體的可持續發展水準。2017年，我們對電站物料、研發及生產物料、裝備品質非核心設備的供應商從技術、採購和品質等維度進行能力評價分析。

截至2017年12月31日，我們的供應鏈中游供應商總數為75家，下游供應商為35家。

Case: Hanergy Thin Film Power Conducts Supplier Performance Assessment and Evaluation

案例：漢能薄膜發電開展供應商績效考核評估工作

In 2017, Hanergy Thin Film Power conducted inspections, assessments, audits and monitoring of key suppliers on the global supply chain. Among these actions, the Procurement Department of Supplies for Power Plants selected 29 cooperative suppliers to carry out annual performance appraisal in terms of 4 units-organization technology, quality, logistics and brand management. 100% of them were qualified, 55% rated excellent. 36 R&D and production material suppliers have been chosen for assessment and 57.14% of them passed the audit the first time. 29 non-core equipment suppliers have been chosen for assessment and 48% of them passes the audit the first time. After understanding the suppliers' willingness to cooperate and comprehensive strength, we put forward suggestions for improvement for some suppliers, and will continue to follow up their improvement in 2018.

2017年，漢能薄膜發電對全球供應鏈上的重點供應商進行了考察、評估、審核和監控。其中，電站物料採購部組織技術、品質、物流、品牌管理4個部門挑選29家合作供應商進行了年度績效考核評估，合格率100%，優秀率55%；研發及生產物料供應商抽查了36家，一次審核通過率為57.14%；裝備品質非核心設備供應商抽查了29家，一次審核通過率為48%。在瞭解供應商合作意願、綜合實力的前提下，我們對部分供應商提出了改進建議，且將在2018年持續關注供應商的改進情況直至問題終止。

Case: Hanergy Thin Film Power Holds 2017 Channel Partner Conference  
案例：漢能薄膜發電召開2017年渠道合作夥伴大會

In 2017, Hanergy Thin Film Power held a distributor conference to announce strategies on distributed product channel construction and distributed product marketing, providing more comprehensive support for distributed product channel construction. At the conference, outstanding distributors were commended to boost distributor confidence.

2017年，漢能薄膜發電召開經銷商大會，發佈分佈式產品渠道建設及分佈式產品市場策略，對分佈式產品渠道建設上提供更為全面的支援，並對優秀經銷商進行表彰，全面提振經銷商的信心。



2017 Hanergy Thin Film Power Channel Partner Conference  
2017年漢能薄膜發電渠道合作夥伴大會



## 5. The Talent Highland: Our Outstanding Team

Talent is the foundation of an enterprise's development and the most important propeller for sustainable development of the enterprise. Hanergy Thin Film Power fully respects the value and voice of each employee. It is concerned about employees' physical and mental health and professional development. It provides employees with a sound working environment, salary system and development platform, and shares its existence, growth, and prosperity with employees.

### 5.1. Caring for Employees' Rights and Benefits

Over the years, we have persisted in providing employees with a solid guarantee of rights and interests and in creating a fair, just, safe, and harmonious working environment for our employees. We actively explore the needs of employees and thoroughly understand and respond to their various needs at work. We value the occupational safety of our employees, and continuously improve our office environment to protect employees' health.

#### 5.1.1. Attracting and retaining talents

The Company strictly abides by the *Labor Law of the People's Republic of China*, the *Labor Contract Law of the People's Republic of China*, and the relevant laws and regulations in the regions where it operates. We provide employees with equal opportunities for employment and avoid discrimination on any ground be it religion, ethnicity, gender, political view, nationality, marital status, disability, gender identity, or gender orientation. In order to further standardize its recruitment and employment system and eradicate child labor or any form of forced labor, the Company has formulated the *Recruitment and Employment Management System* and the *Personnel Management System* which define clearly recruitment plans, processes and channels, on-boarding management, personnel files and information management, and labor relations management, etc.

In 2017, we organized a variety of recruitment activities, such as sharing sessions, special lectures on experiential recruitment across the country, mutual selections, and special events "Teacher Summit" to enhance the Company's appeal to talents. We also adopted the "442111" talent selection model, following the principles of "people to job matching" and "finding competent people to get things done". We explore talents with abundant enthusiasm and suitable skills and guarantee that candidates have abilities and experience to fit in with the corresponding job requirements.

## 5. 人才高地：我們的卓越團隊

人才是企業發展的根本，是企業可持續發展最重要的推動力。漢能薄膜發電充分尊重每一位員工的價值和聲音，重視員工身心健康和職業發展，為員工提供良好的工作環境、薪酬體系和發展平台，與員工共生、共榮、共成長。

### 5.1. 關注員工權益

多年來，我們始終堅持為員工提供堅實的權益保障，為員工打造一個公平公正、安全、和諧的工作環境。我們積極探索員工的需求，深入瞭解員工工作中的各類需求，並予以回應；我們重視員工的職業安全，持續改善辦公環境，呵護員工健康。

#### 5.1.1. 吸納及保留人才

公司嚴格遵守《中華人民共和國勞動法》、《中華人民共和國勞動合同法》及運營地區的相關法律、法規和制度，為員工提供平等的工作機會，避免任何形式的歧視，如宗教、種族、性別、政見、國籍、婚姻狀況、殘疾、性別認同或性別取向等。為進一步規範招聘錄用制度，杜絕童工和任何形式強制員工勞動的情況發生，公司制定《漢能薄膜發電集團招聘錄用管理制度》、《人事管理制度》，對招聘計劃、招聘流程、招聘渠道、入職管理、人事檔案及資訊管理、勞動關係管理等做出了明確的解釋。

2017年，我們舉辦智享會、體驗式招聘全國專場宣講會、雙選會、教師峰會專場等多樣化的招聘活動，加強公司對人才的吸引力。我們還啟用「442111」的人才選拔模式，遵循「人崗匹配」和「成事」的原則，發掘充滿熱忱和掌握合適技能的人才，認保證候選人的能力、經驗須符合崗位要求。



“442111” Talent Selection Model  
“442111”人才選拔模式

**Case: Hanergy Thin Film Power’s Trial in School-Enterprise Cooperation Praised by CALSS**

案例：漢能薄膜發電探路校企合作，獲勞科院點讚

The Ministry of Human Resources and Social Security has always hoped that enterprises provide opportunities for college students to study, practice, and intern. Hanergy takes the initiative to offer students the opportunity to intern and organize “Hanergy University League Graduates Employment Seminar”, reflecting Hanergy’s emphasis on talent, commitment to social responsibility and the most typical “Internet thinking” of the moment.

— Mo Rong, Deputy Dean of the Chinese Academy of Labor and Social Security (CALSS) of the Ministry of Human Resources and Social Security

On December 20, 2017, Hanergy Thin Film Power and 51Job jointly organized the first “Hanergy University League Graduates Employment Seminar” on the theme of “Hanergy’s Great Mission to be Achieved by You” at Hanergy Olympic Forest Park Headquarters. The Company had close contact with nearly 40 teachers responsible for graduates’ employment from more than 30 well-known universities across the country. We conducted in-depth exchanges on the Company’s talent strategy and the current employment problems faced by Chinese university graduates, creating conditions for further school-enterprise cooperation between the Company and the well-known universities in China.

一直以來，人力資源和社會保障部門都希望企業能為我們的大學生提供學習、實習和實踐的機會，漢能能夠主動提出讓學生來實習，主動組織這個「漢能高校聯盟大學生就業研討峰會」，體現了漢能對人才的重視、對社會責任的承擔和當下最典型的「互聯網思維」。

— 人力資源和社會保障部中國勞動和社會保障科學研究院副院長 莫榮

2017年12月20日，由漢能薄膜發電和前程無憂聯合舉辦，以「漢之大任，因你而能」為主題的首屆「漢能高校聯盟大學生就業研討峰會」在漢能薄膜發電奧森總部舉辦。公司與來自全國三十餘所知名大學的近40位負責應屆畢業生就業的老師近距離接觸，就公司的人才戰略和當前中國大學生就業面臨的問題展開了深入交流，為公司與全國知名高校進一步開展校企合作創造條件。

Case: Hanergy Thin Film Power Launches Certified Interviewer Training and Certification Program

案例：漢能薄膜發電啟動金牌面試官培訓與認證項目

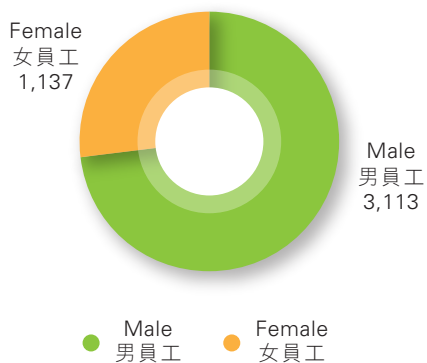
On June 9, 2017 Hanergy Thin Film Power officially launched the Certified Interviewer Training and Certification Program to cultivate interviewers with the ability to select people and to establish a leading and accurate selection system for the Company. Throughout the year, the Company launched four sessions of "Certified Interviewer Training" for recruiting people for core positions, which were attended by 200 trainees in total. It also organized four sessions on "Interviewer Certification", certifying 66 people as interviewers.

2017年6月9日，漢能薄膜發電正式啟動金牌面試官培訓與認證項目，以培養具備選人能力的面試官，建立公司千裡挑一的領先精準選人體系。全年，公司為招聘核心崗位人群開展4期《金牌面試官培訓》，累計培訓人數200人，組織4期《金牌面試官認證》，66人通過金牌面試官認證。

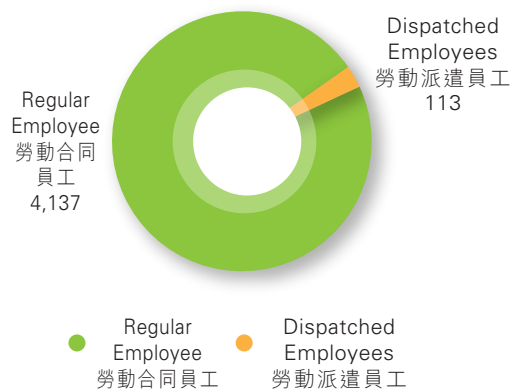


Certified Interviewer Training  
金牌面試官培訓

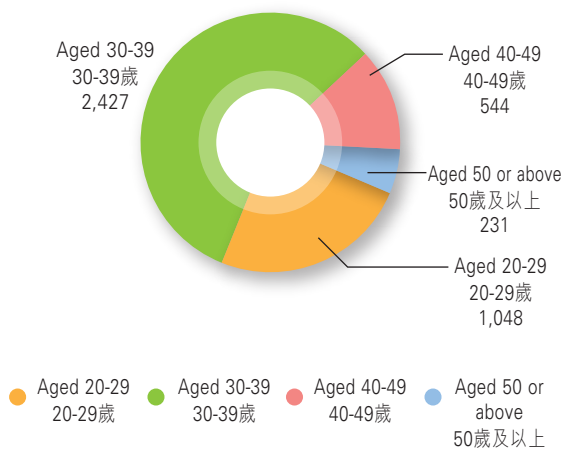
Number of Employees by Gender  
按性別劃分的員工人數



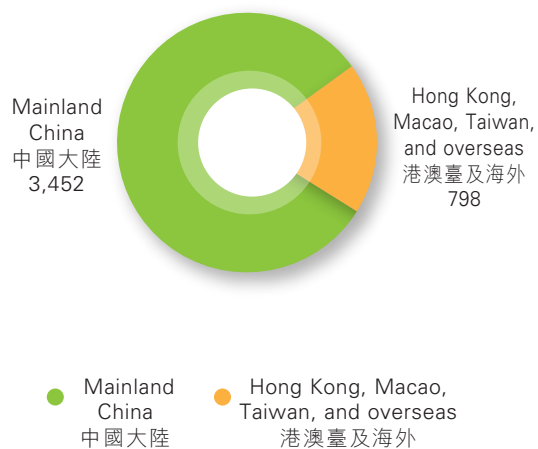
Number of Employees by Employment Type  
按僱傭類型劃分的員工人數



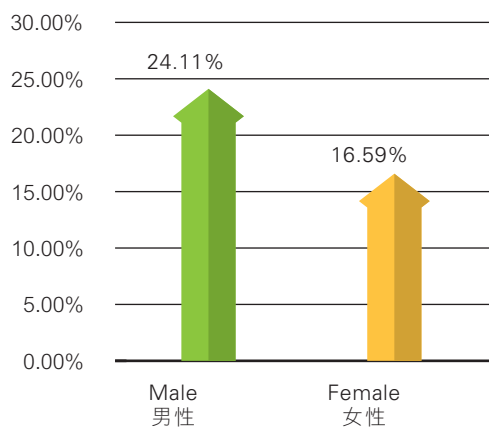
Number of Employees by Age  
按年齡劃分的員工人數



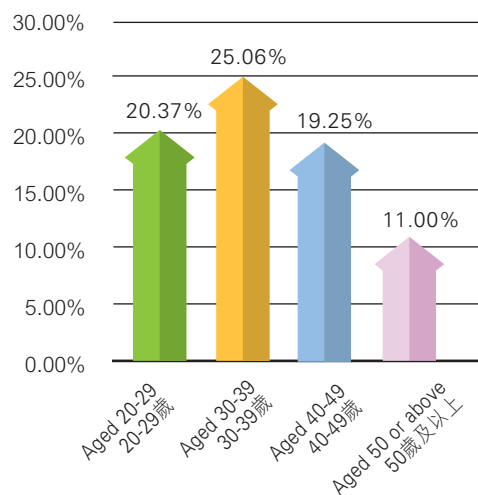
Number of Employees by Geographic Region  
按國籍劃分的員工總數



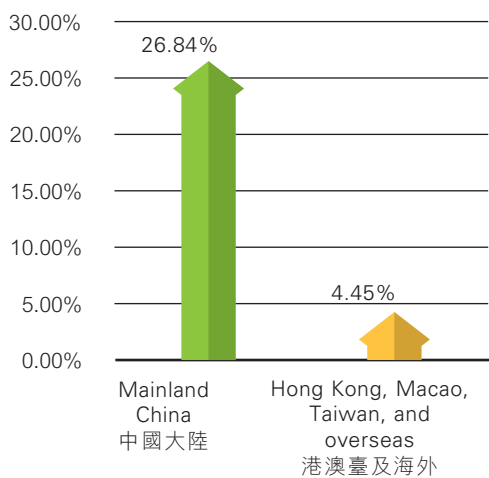
Turnover Rate by Gender  
按性別劃分的流失比率



Turnover Rate by Age  
按年齡劃分的流失比率



Turnover Rate by Geographic Region  
按地區劃分的流失比率





The Company values the contribution of its employees and seeks different ways to reward employees. We provide employees with competitive remuneration packages and benefits such as medical insurance, accident insurance, and free meals. We set store by deepening the reform of the salary system and giving full play to the incentive role of the remuneration and welfare system in motivating employees, so that employees lead a decent and dignified life.

The Company consistently expands its communication channels with employees, listens to their needs and concerns, and improves their sense of identity and engagement with the Company. Making full use of the OA office platform, we timely release various systems, policies, and important dynamics of the Company to protect employees' right to information. We open dedicated WeChat account and email box to support employees' complaints and protect their right to appeal. Employees can also report problems from their work to immediate supervisors. If an employee believes that his/her problem has not been effectively solved or the problem originates from the immediate supervisor, he or she may report it to the higher-level management or HR Department. The management at all levels and HR Department will answer employees' questions in a timely manner and take action to solve problems.

### 5.1.2. Occupational Health and Safety

The Company regards workplace health and safety as an indispensable part of corporate social responsibility and provides its employees with a healthy and safe working environment. We strictly abide by the *Labor Law of the People's Republic of China*, the *Production Safety Law of the People's Republic of China*, and the relevant laws and regulations in the regions where we operate, and have established an occupational health and safety management system.

We pay great attention to the health of employees by organizing regular physical examinations every year. We purchase medical insurance for all employees. In addition to reimbursement of employees' daily outpatient and emergency medical expenses and hospitalization expenses, we provide compensation for employees suffering from 30 serious diseases and injuries, disabilities and deaths from accidents. The Company has also equipped its office locations with air purifiers and ergonomic desks and chairs and special ladders for employees to pick up items placed high above, guaranteeing the safety of employees during work.

公司重視員工的貢獻，尋求不同方式確保員工得到回報。我們為員工提供具有競爭力的薪酬待遇及多項福利，如醫療保險、意外保險、免費膳食等。我們重視深化薪酬制度改革，發揮薪酬福利制度對員工的激勵作用，讓員工過上體面、有尊嚴的生活。

公司持續拓展員工溝通渠道，聆聽員工的需要和關注的問題，提高員工對公司的認同感和參與感。我們充分利用OA辦公平台，及時發佈各項制度、政策和公司重要的動態資訊，保障員工的知情權。我們通過公佈微信號、電子郵箱等措施支援員工申訴，保障員工申訴權。員工也可以向直接主管反映工作上的問題。如果員工認為問題沒有得到有效解決或問題源自直屬主管，可向上一級管理層或人力資源部反映。各級管理層和人力資源部將及時解答員工的疑問，並採取行動解決問題。

### 5.1.2. 職業健康安全

公司將工作場所的健康及安全視為企業社會責任不可或缺的一部分，全力為員工提供健康安全的工作環境。我們嚴格遵守《中華人民共和國勞動法》、《中華人民共和國安全生產法》及運營地區的相關法律、法規和制度，建立公司職業健康安全管理體系。

我們關注員工身體健康，每年定期組織員工進行健康體檢。我們為所有員工購買醫療保險，除了保證員工日常門急診及住院費用報銷以外，還為患30種重大疾病、意外傷殘、意外身故的員工進行賠償。公司還在辦公場所配備空氣淨化機，為員工購買符合人體工程學的桌椅以及取用高層物品的專用腳踏取貨梯凳，為員工工作期間的人身安全提供保障。

Potential safety hazards hide in the processes and sections at construction sites. We have formulated the *Compilation of Regulations for Construction Safety Management* in 12 aspects including sub-contractor qualification review and safety management, safety tool management, safety management in high-place operation, safety management of fire operation, HSE assessment management, and comprehensive emergency plan for construction accidents, etc. The Regulations ensure employees' working conditions to be met in construction and production activities and prevent accidents. We regularly organize various types of safety education and publicity activities, safety trainings such as training on hazard identification, and regularly organize employees to participate in emergency drills. Safety production education and training run throughout our production and operation process to raise employees' awareness of safety.

In 2017, no fatal accidents occurred with the Company.

## 5.2. Building a Platform for Employees' Development

Excellent employees are the core competitiveness of enterprise development. We place a high value on employees' emotions, self-esteem, value and development by continuously unblocking the channels for their promotion and development, giving full play to their potential, and maximizing their self-worth. We have established a complete employee training system to meet their needs for knowledge and skills and stimulate their enthusiasm and interest in self-learning, so as to achieve common development with employees.

### 5.2.1. Career Development

We respect the characteristics and the growth law of talents and have established a dual-channel talent development path for employees in different positions, to clearly define a career plan and achieve the plan. In 2017, in order to improve the employee promotion management mechanism and ensure the promotion to be fair, impartial, efficient and orderly, we formulated the *Measures for Management of Employee Promotions* in accordance with the *Personnel Management System*, related systems of cadre management and the actual situation of the Company. The *Measures* explained the promotion of positions and ranks and stipulated conditions of nomination, promotion management, nomination and promotion processes, approval authority and post-promotion management, etc.

安全隱患隱匿於施工現場的工段、工序中。我們制定《建設安全管理規定彙編》，從分包單位資質審查安全管理、安全工器具管理、高處作業安全管理、動火作業安全管理、HSE考核管理、工程建設事故綜合應急預案等十二個方面做出規定，保證員工在施工、生產活動中的作業條件，防止安全事故的發生。我們定期組織開展形式多樣的安全教育宣傳活動，開展危險源識別等安全培訓，並定期組織員工參加應急演練活動，將安全生產教育和培訓工作貫穿於生產經營的全過程，提高員工安全意識。

2017年，公司沒有發生任何因工死亡事故。

## 5.2. 構建發展平台

優秀的員工是企業發展的核心競爭力。我們關注員工的情感、自尊、價值和發展，持續暢通員工晉升發展通道，充分發揮員工的潛力，最大限度激發員工實現自我價值。我們建立完備的員工培訓體系，滿足員工對知識技能的需求，激發員工積極性和自主學習性，與員工共同發展。

### 5.2.1. 員工職業發展

我們尊重人才特點和成長規律，幫助不同崗位建立了人才雙通道發展路徑，員工明確職業生涯規劃，實現職業理想。2017年，為了完善員工晉升管理機制，確保員工晉升事宜公平、公正、高效、有序地進行，我們根據《人事管理制度》、幹部管理相關制度並結合公司實際情況，制定了《員工晉升管理辦法》，對職位晉升和職級晉升作出了解釋，對提名條件、晉升管理、提名及晉升流程、審批許可權及晉升後管理等內容作出了規定。



Hanergy Thin Film Power Dual Channel Talent Development Path  
漢能薄膜發電職位雙通道發展路徑

### 5.2.2. Employee Training

Independent learning and sharing of employees is an important guarantee for the Company's continuous change and innovation. In order to establish a continuous and systematic training and talent system, build a learning organization, and promote advance management, we have formulated the *Training Management System (Trial)*, *Employees' Training and Development System*, *In-house Trainer Management System*, *Measures for Trainer Management (Trial)* and *Measures for Mentor Management (Trial)*. These systems and measures standardize and promote the Company's launch of a variety of trainings, cultivate and manage the key personnel at all levels to meet the needs of organizational and business development, and improve the professional skills and qualities of all employees. We combine corporate strategy and needs to enhance employees' professional abilities. Trainings are carried out for different levels and different positions, and a hierarchical curriculum system has been built for managers and employees at different positions and levels. Employees must complete the required training before turning formal employees, being promoted or taking qualification assessment.

### 5.2.2. 員工培訓

員工自主學習與分享是公司「持續變革與創新」的重要保證。為建立持續、系統的培訓與人才體系，建立學習型組織，推動管理進步，我們制定《培訓管理制度(試行)》、《員工培訓與發展制度》、《內部講師管理制度》、《講師管理辦法(試行)》、《導師管理辦法(試行)》，規範和促進公司各項培訓工作開展，培養適應組織與業務發展需要的各級業務骨幹、管理領導人才，提升全員職業技能與專業素質。我們將公司戰略和員工職業能力提升需求相結合，基於崗位勝任分層分級開展培訓，針對不同崗位、不同層級的管理人員和員工建設分層分級的課程體系並開展培訓。員工在轉正、晉升及任職資格評定前，須完成要求的相關培訓。

We provide diversified training for employees, such as new employee induction during the probationary period and in-house training for employees who have passed probation and turned formal. For employees who need to upgrade a certain skill to meet the development needs of the Company, we send them to be trained at training institutions. In order to enhance employees' international perspectives and cross-cultural communication capabilities, we also provide training overseas, sending them to work and study abroad. We advocate employee self-learning, group learning, and continuous learning. In addition to classroom training and online training, the Company encourages multiple forms of learning and improvement. Employees are encouraged to use their spare time to study for work-related professional qualifications that enjoy high recognition in the industry. With these measures, we are advancing the establishment of a learning organization.

In 2017, we made many efforts in training. We established Hanergy College to work from four aspects of corporate culture and spirit inheritance, promotion of organizational change and talent development, business management and performance improvement, and corporate knowledge management and learning organization building. The college serves as a learning platform for employees.

我們為員工提供多樣化的培訓，如針對新進入職未滿試用期的員工提供新員工培訓，為試用期合格且正式聘用的員工提供內部培訓。針對需要提升某項技能以適應公司發展需求的員工，我們還將提供員工外派到培訓機構培訓的機會。為了提升員工國際視野、跨文化交流能力，我們也會提供海外培訓，將員工外派到國外進行工作和學習。我們宣導員工自我學習、團體學習、持續學習，除課堂集中培訓和網路培訓外，公司鼓勵多種形式的學習與提高，鼓勵員工利用業餘時間參加與工作相關的、業界具有較高認可度的專業資格認證學習，推進學習型組織的建立。

2017年我們在培訓方面做了諸多努力。我們成立漢能學院，從企業文化與企業精神傳承、組織變革推動與人才發展、經營業務管理解決與績效提升和企業知識管理與學習型組織打造四個方面開展多項工作，搭建員工學習平台。

#### Hanergy College's Achievements in 2017

##### 漢能學院2017年開展的工作

Corporate culture and spirit inheritance 企業文化與企業精神傳承	A variety of training sessions and activities were organized such as president training camps, Hanyuan Tour, luncheon and learning forums, and executives training camps on values and execution, with a cumulative participation of more than 7,000 person times. 開辦總裁班訓練營、漢源之旅、午餐與學習論壇、高職價值觀執行力訓練營等多種培訓班及活動，累計參與7,000餘人次
Promotion of organizational change and talent development 組織變革推動與人才發展	A number of training programs were launched including new cadre training camps, leadership training camps for high-potential cadres, mentor certification training, new employee training camps, post-doctoral workstations, college students and veterans programs, etc. Planning for talent development programs and systems was completed and more than 300 courses were sorted out systematically. 啟動新晉幹部訓練營、高潛質幹部領導力訓練營、導師認證培訓、新員工訓練營、博士後工作站、大學生與退役軍人項目等培訓計劃，完成人才發展方案策劃和體系規劃，並完成300多門課程的體系梳理

## Hanergy College's Achievements in 2017

### 漢能學院2017年開展的工作

Business management and performance improvement 經營業務管理解決與績效提升	<p>Training programs such as pre-job training, marketing model research, key position certification training, etc. were launched. An eight-step model and standard processes were formed for business support planning which help the business departments identify work difficulties and actively provide solutions to the landing of the plans.</p> <p>開展業務上崗前培訓、行銷商業模式研究、關鍵崗位認證培訓等培訓項目，形成業務支援計劃操作八步法的模式和標準流程，助力業務部門挖掘工作難點，並積極提供解決方案，支援計劃落地</p>
Corporate knowledge management and learning organization building 企業知識管理與學習型組織打造	<p>A group learning management system, online course system, mobile classrooms, etc. were set up. The Company also clarified its training assessment mechanism, organizational structure, and workflow and standards.</p> <p>搭建集團學習管理系統、線上課程體系、移動課堂等，明確公司培訓考核機制、組織架構、工作流程標準</p>

We have established a four-level training system and a four-level training management structure, defining the division of responsibilities and assessment standards for training management departments at all levels. Hanergy College is responsible for overall management, supervision and support level by level, professional vertical guidance, and dual-standard assessment to ensure the training management system works well.

我們建立四級培訓體系和四級培訓管理架構，明確各層級培訓管理部門的職責分工及考核標準，由漢能學院統籌管理、逐級督導、逐級支援、專業垂直指導、雙線考核，確保培訓管理體系良好運轉。



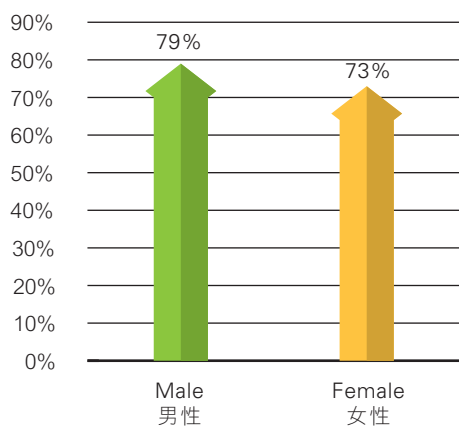
Four-level Training Management Structure  
四級培訓管理架構



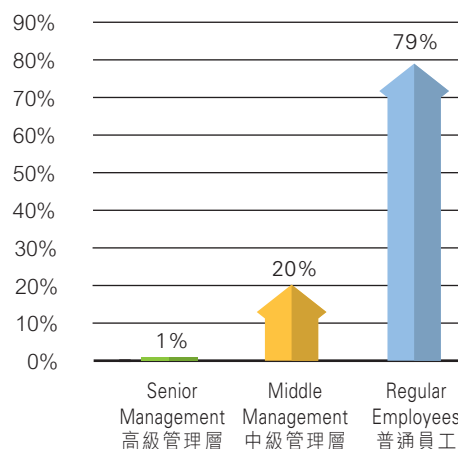
In 2017, Hanergy College organized a series of training programs and training activities to enhance employees' comprehensive capabilities and competitiveness. Different units also carried out their own training. They did a lot of work on training management in the five aspects of corporate culture, business skills, new employees, generic skills, management and leadership. More than 120 training sessions on cultural and learning capability building, more than 180 sessions on business skills, more than 50 sessions on new employee induction, 15 sessions on generic skills, 12 sessions on management and leadership were carried out among other training sessions. During the reporting period, the percentage of employees trained at Hanergy College was 77.5%, 5.2 hours of training per person on average.

2017年，漢能學院組織開展了一系列的培訓計劃和培訓活動，提升員工綜合能力和外部競爭力。各事業部也各自開展培訓，在企業文化、業務技能、新員工、通用技能、管理與領導力五大類培訓管理方面做了大量工作，開展文化學習建設培訓120餘場，業務技能培訓180餘場，新員工培訓50餘場，通用技能15場，管理領導力培訓12場，其餘培訓若干。報告期內，在漢能學院接受培訓僱員百分比為77.5%，員工平均受訓時數為5.2小時/人。

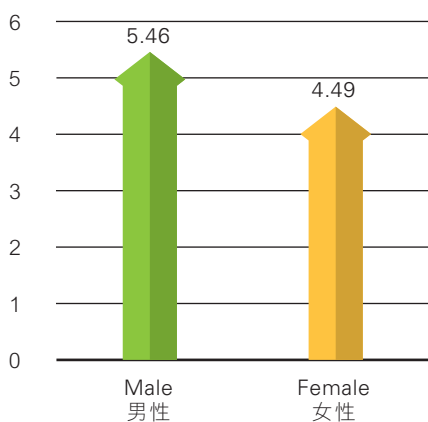
Training Percentage by Gender  
按性別劃分的受訓比例



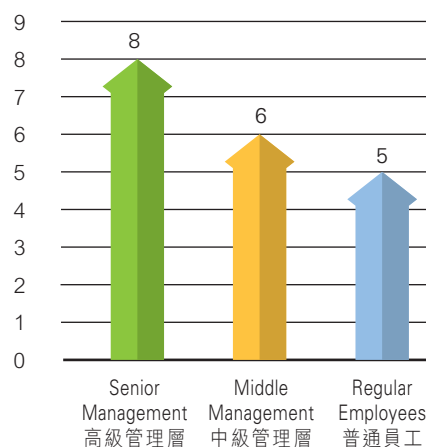
Training Percentage by Employee's Type  
按僱員類別劃分的受訓比例



Training Hours by Gender  
按性別劃分的受訓時數



Training Hours by Employee's Type  
按僱員類別劃分的受訓時數



### Case: Hanergy Thin Film Power's Luncheon and Learning Forum

案例：漢能薄膜發電舉辦午餐與學習論壇

Hanergy Thin Film Power holds "Luncheon and Learning Forum" to create a learning atmosphere within the Company, which allows employees to understand the Company's business more clearly and provides a platform for communication between employees in different departments. For example, in July 2017, more than 120 people participated in the luncheon and learning forum under the theme of "Cultural Transformation and Inheritance" where they learned about Hanergy's outstanding culture and the importance of cultural heritage. On the forum, the employees actively exchanged views in a vibrant atmosphere. Throughout the year, Hanergy Thin Film Power held 24 luncheon and learning forums with more than 2,400 person times to participate.

漢能薄膜發電設置「午餐與學習論壇」，在公司內部營造學習的氛圍，讓員工們更清楚地瞭解公司的業務，也為不同部門的員工提供溝通交流的平台。例如，2017年7月，120餘人參加了以「文化變革與傳承」為主題的午餐與學習論壇，瞭解漢能擁有優秀的文化，文化傳承的重要性。論壇上，員工們積極發言交流，氣氛良好。全年漢能薄膜發電共舉辦「午餐與學習論壇」24期，參加人數超過2,400人次。



Luncheon and Learning Forum 午餐與學習論壇

### 5.3. Creating a Family Atmosphere

We care about employees' lives and mental health by tapping into employees' working and living needs, providing convenience for their lives, and solving their practical difficulties. We encourage employees to strike a balance between work and life by providing them with venues for cultural activities. We consistently improve their sense of identity and belonging with the Company and create a home-like atmosphere.

### 5.3. 營造家園氛圍

我們用心關心員工生活及精神健康，瞭解員工的工作生活需求，為員工生活提供便利，解決實際困難；我們鼓勵員工平衡工作和生活之間的關係，為員工提供文化活動場所，持續提高員工對企業的認同感和歸屬感，營造家園氛圍。

We care about retired employees by establishing a WeChat group for retired employees and sending them electronic cards and gifts on birthdays and major holidays. We protect the lawful rights of female employees. By setting up nursery rooms in each office area to provide special protection for female employees during pregnancy and breastfeeding, we have wholehearted care for female health. We constantly provide employees with support and assistance and especially help those needy employees address real difficulties in their life. In 2017, we offered financial aid to six employees with critical illnesses, totaling RMB140,000.

We organize multi-form and multi-level corporate cultural activities such as walking, fun sport games, and basketball matches to create opportunities for employees to communicate and enrich their cultural lives. In 2017, we rent venues to hold basketball, football, badminton and tennis matches for our employees. 1-2 rounds were held per week and 2,500 person times took part in the games throughout the year. The Company's headquarters has organized six power walking activities with a total of 320 participants.

我們關心退休員工，建立退休員工微信群，生日、重大節日為退休員工發放電子慰問卡和慰問禮品。我們保障女性員工的合法權益，在每個辦公區設置育嬰室，為處於孕期、哺乳期的女性員工提供特殊保護，全心呵護女性健康。我們持續開展員工關愛扶助工作，切實幫助面對困難的員工解決生活中的實際困難。2017，我們對6名重大疾病員工提供財務資助，合計金額14萬元人民幣。

我們組織開展健步走、趣味運動會、籃球友誼賽等多形式、多層級的企業文化活動，為員工創造溝通機會，豐富員工文化生活。2017年，我們為員工租借籃球、足球、羽毛球、網球4個活動場地，每週舉行1-2場活動，全年場地活動達2,500人次。公司總部先後組織6次健步走活動，共有320人次參與活動。

#### Case: "I'm Healthy, I'm Happy", a Friendship Match in Hanergy Thin Film Power

案例：漢能薄膜發電開展「我健康、我快樂」友誼賽

On July 27 and August 17, 2017, basketball team and football team of Hanergy Thin Film Power competed respectively with Beikong Energy basketball team and Ciming Group football team in "I'm Healthy, I'm Happy" Friendship Match. Holding a friendly match is not only a concrete embodiment of invigorating the cultural and sports life and creating a harmonious working and living environment for employees. It is also a practical move to carry forward the corporate culture. Employees not only honed their skills on the court, but also had more exchange and communication with each other, effectively strengthening their team spirit and hard-working spirit.

2017年7月27日和8月17日，漢能薄膜發電籃球隊、足球隊分別與北控能源籃球隊、慈銘集團足球隊進行「我健康、我快樂」友誼比賽。舉辦友誼賽，既是活躍員工文化體育生活，營造和諧工作生活環境的具體體現，也是弘揚傳承企業文化的實際步驟，不僅鍛煉了場上選手的球技，更加強了相互間的橫向交流和溝通，有效地提高了公司員工的團隊精神和拼搏進取意識。



Basketball Friendship Match 籃球友誼賽



Football Friendship Match 足球友誼賽

Case: “Discovering the Beauty of Hanergy” WeChat Photography Contest  
案例：「發現漢能之美」微信攝影比賽活動

In September 2017, Hanergy Thin Film Power launched the “Discovering the Beauty of Hanergy” WeChat photography contest to better demonstrate the Company’s style and culture, and create a positive and progressive cultural atmosphere. During the event, 152 people took part in the competition with 224 works submitted.

2017年9月，漢能薄膜發電開展「發現漢能之美」微信攝影比賽活動，以便更好地展現公司的風采，體現公司文化，營造積極向上的文化氛圍。活動期間，152人積極參賽，上交作品224幅。



Part of the Photography Works 部分作品展示



Case: Hanergy Thin Film Power Holds“ Sports, Health, and Happiness” Fun Games

案例：漢能薄膜發電舉辦「運動•健康•快樂」趣味運動會

On November 18, 2017, the Company organized the “Sports, Health, and Happiness” Fun Games. The Games set up six events, respectively “Tug of War,” “Angry Birds,” “Kangaroo Transporting Watermelon,” “Inflatable Bumperball,” “Rolling Fortune,” and “Energy Ball Pass” to enhance employees’ ability of collaboration and physical strength. 150 employees participated in this event.

2017年11月18日，公司舉辦「運動•健康•快樂」趣味運動會，設置「拔河」、「憤怒的小鳥」、「袋鼠運瓜」、「充氣碰碰球」、「財源滾滾」、「能量球傳遞」六個項目，以提升員工團結協作能力、鍛煉員工體力。公司150人參加此次趣味運動會。



Kangaroo Transporting Watermelon 袋鼠運瓜



Inflatable Bumper Ball 充氣碰碰球



## 6. Contribution to the Society: Our Philosophy of Philanthropy

As a responsible enterprise, Hanergy Thin Film Power always puts social responsibility in an important position of the enterprise development. In 2017, through the cooperation with multiple mobile energy industrial parks, Hanergy Thin Film Power helped promote the local development of the thin film solar mobile energy industrial park and bring employment opportunities and stable income for local government and people. At the same time, Hanergy Thin Film Power continues to respond to the "PV poverty alleviation" policy led by National Energy Administration and The State Council Leading Group Office of Poverty Alleviation and Development. We conscientiously implement the national policy of anti-poverty development, conduct research on PV policy, establish regional anti-poverty strategies and explore a sustainable way of PV poverty alleviation.

### 6.1. Support for Regional Economic Development

Hanergy Thin Film Power provides a series of portfolios of products from turnkey production line for the mobile energy industrial park, including a-Si, CIGS, GaAs and c-Si HJ, in order to encourage local government to make full use of solar energy technology and attract other high-tech companies to enter the new industrial park.

In the process of promoting local economy's transformation and upgrading, mobile energy industrial park is an active layout of local government for high technology such as thin film solar power as well as emerging sectors of strategic importance. Local government can preferentially use the solar power systems produced by local solar manufacturers in the park for distributed PV power generation, agriculture facilities, urban lighting, public buses, electric vehicles, highway and government funded poverty alleviation projects as well as other similar local projects. These measures help promote energy conservation, emission reduction and industrial structure transformation & upgrading in the region and, at the same time, the cluster effect of the upstream, midstream and downstream industries is formed, and the economic growth in the project-located regions is stimulated.

## 6. 奉獻社會：我們的公益之道

作為負責任的企業，漢能薄膜發電始終將社會責任放在企業發展的重要位置。2017年，漢能薄膜發電與多個移動能源產業園合作，助推薄膜太陽能移動能源產業園於當地發展，為當地政府、人民帶來就業機會和穩定收入。同時，漢能薄膜發電繼續回應國家能源局和國務院扶貧辦兩部委牽頭實施的「光伏扶貧」政策方案，認真貫徹落實國家扶貧開發方針，研究光伏政策，制定區域扶貧策略，探索具有漢能薄膜發電特色的、可持續的光伏扶貧之路。

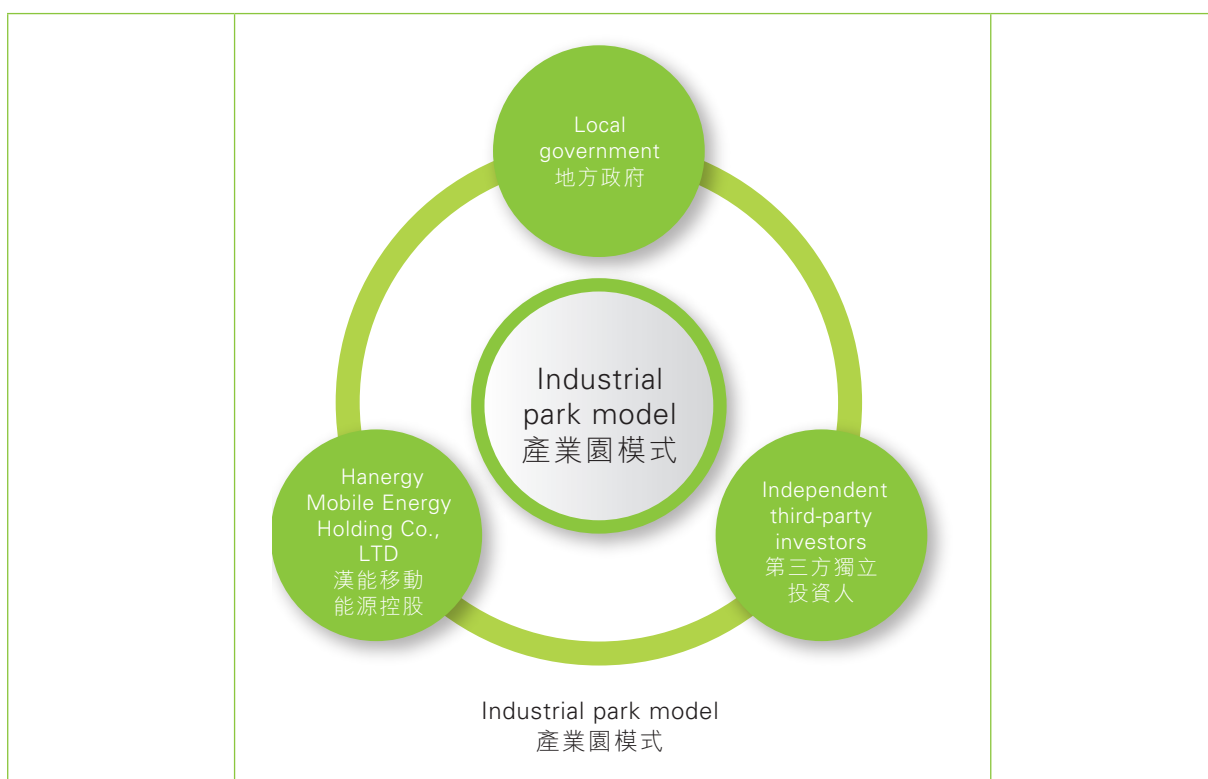
### 6.1. 助力區域經濟發展

漢能薄膜發電為移動能源產業園提供a-Si，CIGS，GaAs和c-Si異質結(HJ)一系列交鑰匙生產線產品組合以利地方政府使用太陽能技術並吸引其他高科技公司進入新產業園。

移動能源產業園是地方政府發展地方經濟轉型升級的過程中，對薄膜太陽能等高新技術和戰略性新興產業的積極佈局。當地政府可優先在園區中利用當地太陽能製造廠生產的太陽能系統，用於分佈式光伏發電和農業設施、城市照明、公共巴士、電動車輛、高速公路和政府資助的扶貧及其他類似地方項目，在實現促進區域節能減排和產業結構轉型升級的同時，在當地形成上、中、下游產業集群效應，拉動項目所在地的區域的經濟增長。

In the development of the industrial park, it is mainly funded by the local government, third party investors and the affiliates of Hanergy Mobile Energy Holding Co., Ltd, to form an industrial park project company. Leveraged on the financial capital, social capitals are attracted to form an equity investment fund. This will help realize the introduction of capital into the projects for the creation of the modern “high-tech + energy” industry chain, which embodies the research and development of thin film cell technologies, high-end equipment manufacturing, modules production and the development of application products.

產業園模式主要由地方政府、第三方投資者及漢能移動能源控股有限公司（簡稱「漢能移動能源控股」）聯屬公司共同出資，組成產業園項目公司，採取財政資金撬動社會資本的方式，引導社會資本建立股權投資基金，實現資本與項目的對接，打造集薄膜電池技術研發、高端裝備製造、組件生產、應用產品研發於一體的「高科技+能源」現代產業鏈。



- Local government: sending state-owned enterprises with local government background as shareholders of the project company and taking the lead in encouraging third-party institutions to become project investors;
- Independent third-party investors: becoming company shareholders and introducing investments for projects.
- Hanergy Mobile Energy Holding Co., LTD: participating the equity and operation of the project company through investment from the affiliates of Hanergy Mobile Energy Holding and serving as a shareholder (with equity no more than 20%).
- 地方政府：派出具有地方政府背景的國有企業成為項目公司股東，並牽頭找尋第三方機構成為項目投資者；
- 第三方獨立投資人：成為公司股東，為項目引進投資資金；
- 漢能移動能源控股：通過漢能移動能源控股聯屬公司出資及擔任項目公司股東之一（股權不超過20%），對項目公司股權及運營進行參與。

Case: Zibo Mobile Energy Industrial Park  
案例：淄博移動能源產業園

The planned total capacity of Zibo Mobile Energy Industrial Park project is 3GW. Applying copper indium gallium selenide thin film solar batteries and flexible application products, the project plans a total investment of around RMB35 billion and an area of 1,500 mu. It is expected to achieve an annual income of RMB40 billion and provide 15,000 jobs.

In December 2014, Hanergy Holding Group and Zibo People's Government of Shandong Province entered into the Investment Cooperation Framework Agreement of the project. The project fully integrates the technological competitive advantages resources of Hanergy Thin Film Power in this field, and combines the regional advantages and policy support of Zibo Hi-tech District to promote local economic growth.

淄博移動能源產業園項目規劃總產能為3GW，採用銅銦鎵硒薄膜太陽能電池及柔性應用產品，計劃總投資約350億人民幣，佔地1,500畝，預計年銷售收入400億元人民幣，提供15,000個就業機會。

2014年12月，漢能控股集團與山東省淄博市人民政府簽訂了該項目的投資合作協議。該項目充分整合漢能薄膜發電在該領域的技術競爭優勢資源，結合淄博高新區優越的區域和政策優勢，拉動了當地經濟增長。

Case: Datong Mobile Energy Industrial Park  
案例：大同移動能源產業園

In July 2017, the Datong government of Shanxi, Datong Coal Mine Group Co., Ltd and Hanergy Mobile Energy Holding Co., Ltd signed a strategic cooperation agreement on Datong Mobile Energy Industrial Park and jointly invested to establish Datong mobile energy industrial park project. The layout and construction of Datong Mobile Energy Industrial Park project consists three phases. Its total capacity will be 620 MW after completion.

As the two major markets of national advanced technology PV demonstration base and PV poverty alleviation base, Datong Mobile Energy Industrial Park will be able to promote local employment and income & tax increase after its completion. It will greatly promote the formation of solar mobile energy industry in Datong, accelerate the energy transformation in Datong and lead the healthy and sustainable development of regional economy. As a traditional energy base, project of Datong Mobile Energy Industrial Park also has important demonstrative and initiative significance to energy saving and emission reduction as well as industrial structure transformation and upgrading of Shanxi Province.

2017年7月，山西省大同市政府、大同煤礦集團有限公司及漢能移動能源控股，簽署大同移動能源產業園戰略合作協議，在大同市共同投資建設大同移動能源產業園項目。大同移動能源產業園項目分三期佈局和建設，建成後年總產能為620兆瓦。

大同移動能源產業園項目作為國家先進技術光伏示範基地、光伏扶貧基地兩大市場，建成後可帶動當地就業和利稅增收，大力促進大同市太陽能移動能源產業的形成，加速大同市能源轉型，引領區域經濟健康可持續發展。大同移動能源產業園項目對作為傳統能源基地的山西省的節能減排和產業結構轉型升級也具有重要示範和帶頭意義。

## 6.2. PV Poverty Alleviation

As a responsible enterprise, Hanergy Thin Film Power always puts social responsibility in an important position of corporate development. Under the background that our country has been attaching great importance to the “PV poverty alleviation”, Hanergy Thin Film Power seizes every opportunity to continuously explore the road of PV poverty alleviation. Making full use of the land resources of rural poor households, we transfer the most ordinary sunlight to “wealth” in poor households’ road of poverty alleviation. We make efforts to realize the transformation of poverty alleviation from “blood transfusion” model to “blood creation” model and help poor people to realize precise poverty alleviation.

We focus on poverty alleviation by thin film solar power, set up a special working group on poverty alleviation and initiate a new poverty alleviation model. Through agricultural poverty alleviation, distributed power station poverty alleviation and the whole village poverty alleviation, we carry out thin film solar power poverty alleviation project and bring benefits to all poor households in the whole village.

We attach great importance to the combination of PV poverty alleviation and local specific situations in order to fully implement “targeted poverty alleviation”. The poor households who participate in PV poverty alleviation can not only obtain the ownership of PV power equipment, but also gain the economic benefits brought by excess electricity power apart from in-house electricity. Besides, on the premise of not affecting agricultural production, we combine thin film solar power technology with fish ponds and livestock sheds to build a large-scale modern intelligent agriculture project which integrates photovoltaic power generation, fish fishery and husbandry. Combining thin film solar power generation technology with fruit tree plantation, we establish photovoltaic power stations on red date photovoltaic greenhouses to solve the cracking problem of red dates on the basis of clean power generation. Combining the light and lucent thin film solar power generation system with nursery greenhouse, we bring extra power generation benefits without affecting seedling in the greenhouses.

In 2017, Hanergy Thin Film Power continued its efforts in the development of PV poverty alleviation projects. It has signed contracts for or completed more than 30 projects throughout the country, with an installed capacity of over 150 MW, covering 18 provinces or autonomous regions.

## 6.2. 光伏扶貧

作為負責任的企業，漢能薄膜發電始終將社會責任放在企業發展的重要地位。在國家始終高度重視「光伏扶貧」的背景之下，漢能薄膜發電借勢揚帆，不斷探索光伏扶貧之路，充分利用農村貧困戶的土地資源，讓平日裡最尋常的太陽光成了貧困戶脫貧路上的「財富」，從而實現扶貧開發由「輸血式」向「造血式」扶貧的轉變，幫助貧困群眾實現精準脫貧。

我們聚焦薄膜太陽能扶貧，成立專項扶貧工作組，創新推出新型扶貧模式，以農業扶貧模式，分佈式電站扶貧，整村扶貧等模式為主要方式，開展薄膜太陽能扶貧項目，為整村的貧困戶帶來收益。

我們高度重視光伏扶貧與當地特殊情況的結合，切實做到「精準扶貧」。參與光伏扶貧的貧困戶不僅可以得到光伏發電設備的擁有權，還可以獲得除自用電力之外部份電力上網產生的經濟收益。此外，在不影響農業生產的前提下，我們將薄膜太陽能發電技術與魚塘、畜禽棚結合，建設成集「光伏發電、漁光互補、畜光互補」為一體的大型現代化智慧農業專案；將薄膜太陽能發電技術和果樹種植融為一體，在紅棗光伏大棚上建設光伏電站，在實現清潔發電的基礎上解決了當地紅棗的裂果問題；將輕質透光的薄膜發電系統與育苗溫室相結合，在不影響棚下育苗的基礎上帶來額外的發電收益。

2017年，漢能薄膜發電繼續努力發展光伏扶貧項目，涉及全國18個省份、自治區，共簽約或建成超過30個項目，裝機容量超過150MW。

Case: PV Poverty Alleviation Project of Shanxi Weinan Linwei District is successfully grid-connected

案例：陝西省渭南市臨渭區光伏扶貧項目成功併網

On May 16, 2017, the grid-connected power generation ceremony of thin film solar power project for industrial poverty alleviation was held in Yongqingsi Village, Linwei District, Weinan, Shanxi Province. The ceremony marks the official grid-connected power generation of this 290 kW thin film solar power station. With a total investment of RMB4.1 million, the project will generate 650,000 kWh of electricity. The project will bring a 25-year consecutive income with an expected annual income of RMB630,000, which will realize the in-place poverty alleviation of the village collective and 107 poor households.

There are many unfavorable conditions in Yongqingsi Village for poor households including a lack of labor force, sensitivity to market risk, unwillingness of capital investment and so on. But it also has many advantages, such as village collective land, plenty of idle land, the proper intensity and length of sunlight as well as its location within national network coverage, all of which are very suitable for the implementation of PV poverty alleviation projects. For the smooth operation of the project, PV poverty alleviation project in Yongqingsi Village established the "Party branch + cooperative + poor household" dividend mechanism, which integrates 3 poverty alleviation policies including national industrial poverty alleviation subsidy, loan with discounted interest for poor households as well as subsidy for photovoltaic electricity price. The mechanism helps poor households apply industrial poverty alleviation subsidy and anti-poverty loans with discounted interest in order to complete the fund raising and construction of the project.

2017年5月16日，陝西省渭南市臨渭區永慶寺村舉行了產業扶貧薄膜太陽能項目併網發電儀式，這標志著一期290kW薄膜太陽能發電站正式併網發電。項目總投資410萬元人民幣，建成後年發電可達65萬度，預計年收益63萬元人民幣，可以連續25年產生穩定收益，實現村集體和107戶貧困戶就地脫貧。

永慶寺村存在著貧困戶勞動力匱乏、對市場風險敏感、不願投入資金等不利條件，但是也有著村級集體土地、閒置土地較多，光照強度、時長較好，處於國網覆蓋區等優勢條件，非常適合開展光伏扶貧項目。為了項目順利運作，永慶寺村光伏扶貧項目建立「黨支部+合作社+貧困戶」運作分紅機制，整合國家產業扶貧補貼、貧困戶貸款貼息、光伏電價補貼等3項扶貧政策，幫助貧困群申請辦理產業扶貧補貼和扶貧貼息貸款，完成項目資金籌措和項目建設。





Case: PV Poverty Alleviation Project in Boli County, Qitaihe  
案例：七台河勃利縣光伏扶貧項目

In September 2017, the PV poverty alleviation project in Boli County, Qitaihe, Heilongjiang Province started construction. The project will be completed and grid-connected by June 30, 2018. Hanergy Thin Film Power is the project's chief EPC contractor while the local government is responsible for 20% free capital. The remaining 80% capital comes from Agricultural Development Bank loans. All the investment is used to establish a village-level PV poverty alleviation power station on collective abandoned land. After connected to the grid, the power station is expected to bring an annual income of RMB3,000 for each poor household and actually help realize the poverty alleviation of the whole village.

2017年9月，黑龍江省七台河市勃利縣光伏扶貧項目開工，計劃於2018年6月30日前完工併網。漢能薄膜發電作為此次計劃的EPC總承辦商，當地政府負責20%自由資金，另外80%的資金為農業發展銀行貸款，在各村集體廢棄土地投資建設村級光伏扶貧電站。電站建成併網後，將為每戶貧困戶帶來每年收入約3,000元人民幣的收益，真正地實現整村脫貧。

Appendix: HKEX ESG General Disclosures and KPIs  
 香港聯交所《環境、社會及管治報告指引》內容索引

KPIs 指標	Description 指標描述	Disclosure 索引位置
<b>A. Environmental</b> A. 環境		
<b>A1 Emissions</b> A1 排放物		
<b>General Disclosure:</b> 一般披露	Information on a) the policies and b) compliance with relevant laws and regulations that have a significant impact on the issuer relating to air and greenhouse gas emissions, discharges into water and land, and generation of hazardous and non-hazardous waste. 有關廢氣及溫室氣體排放、向水及土地的排污、有害及無害廢棄物的產生等的： (a) 政策；及 (b) 遵守對發行人有重大影響的相關法律及規例的資料。	3.2
<b>A1.1</b>	The types of emissions and respective emissions data 排放物種類及相關排放數據。	3.2.2
<b>A1.2</b>	Greenhouse gas emissions in total (in tons) and, where appropriate intensity. 溫室氣體總排放量（以噸計算）及（如適用）密度（如以每產量單位、每項設施計算）。	3.2.1
<b>A1.3</b>	Total hazardous waste produced (in tons) and, where appropriate intensity (e.g. per unit of production volume, per facility). 所產生有害廢棄物總量（以噸計算）及（如適用）密度（如以每產量單位、每項設施計算）。	3.2.2
<b>A1.4</b>	Total non-hazardous waste produced (in tons) and, where appropriate intensity (e.g. per unit of production volume, per facility). 所產生無害廢棄物總量（以噸計算）及（如適用）密度（如以每產量單位、每項設施計算）。	3.2.2
<b>A1.5</b>	Description of measures to mitigate emissions and results achieved. 描述減輕排放量的措施及所得成果。	3.2.2
<b>A1.6</b>	Description of how hazardous and non-hazardous wastes are handled, reduction initiatives and results achieved. 描述處理有害及無害廢棄物的方法、減輕產生量的措施及所得成果。	3.2.2

KPIs 指標	Description 指標描述	Disclosure 索引位置
<b>A2 Use of Resources</b> A2 資源使用		
<b>General Disclosure:</b> 一般披露	Policies on the efficient use of resources, including energy, water and other raw materials. 有效使用資源(包括能源、水及其他原材料)的政策。	3.2
A2.1	Direct and indirect energy consumption by type (e.g. electricity, gas or oil) in total (kWh in '000s) and intensity (e.g. per unit of production volume, per facility). 按類型劃分的直接及/或間接能源(如電、氣或油)總耗量(以千瓦時計算)及密度(如以每產量單位、每項設施計算)。	3.2.1
A2.2	Water consumption in total and intensity (e.g. per unit of production volume, per facility). 總耗水量及密度(如以每產量、每項設施計算)。	3.2.1
A2.3	Description of energy use efficiency initiatives and results achieved. 描述能源使用效益計劃及所得成果。	3.2.1
A2.4	Description of whether there is any issue in sourcing water that is fit for purpose, water efficiency initiatives and results achieved. 描述求取適用水源上可有任何問題, 以及提升用水效益計劃及所得成果。	3.2.1
A2.5	Total packaging material used for finished products (in tons) and, if applicable, with reference to per unit produced. 製成品所用包裝材料的總量(以噸計算)及(如適用)每生產單位佔量。	Not applicable 不適用

KPIs 指標	Description 指標描述	Disclosure 索引位置
<b>A3 The Environment and Natural Resources</b> <b>A3 環境及天然資源</b>		
<b>General Disclosure</b> <b>一般披露</b>	Policies on minimising the issuer's significant impact on the environment and natural resources. 減低發行人對環境及天然資源造成重大影響的政策。	3.2
<b>A3.1</b>	Description of the significant impacts of activities on the environment and natural resources and the actions taken to manage them. 描述業務活動對環境及天然資源的重大影響及已採取管理有關影響的行動。	3.2
<b>B. Social</b> <b>B. 社會</b>		
<b>B1 Employment</b> <b>B1 僱傭</b>		
<b>General Disclosure</b> <b>一般披露</b>	Information on a) the policies and b) compliance with relevant laws and regulations that have a significant impact on the issuer relating to compensation and dismissal, recruitment and promotion, working hours, rest periods, equal opportunity, diversity, anti-discrimination, and other benefits and welfare. 有關薪酬及解僱、招聘及晉升、工作時數、假期、平等機會、多元化、反歧視以及其他待遇及福利的政策及遵守對發行人有重大影響的相關法律及規例的資料。	5.1.1
<b>B1.1</b>	Total workforce by gender, employment type, age group and geographical region. 按性別、僱傭類型、年齡組別及地區劃分的僱員總數。	5.1.1
<b>B1.2</b>	Employee turnover rate by gender, age group and geographical region. 按性別、年齡組別及地區劃分的僱員流失比率。	5.1.1

KPIs 指標	Description 指標描述	Disclosure 索引位置
<b>B2 Health and Safety</b> <b>B2 健康與安全</b>		
General Disclosure 一般披露	Information on a) the policies and b) compliance with relevant laws and regulations that have a significant impact on the issuer relating to providing a safe working environment and protecting employees from occupational hazards. 有關提供安全工作環境及保障僱員避免職業化危害的政策及遵守對發行人有重大影響的相關法律及規例的資料。	5.1.2
B2.1	Number and rate of work-related fatalities. 因工作關係而死亡的人數及比率。	5.1.2
B2.2	Lost days due to work injury. 因工傷損失工作日數。	5.1.2
B2.3	Description of occupational health and safety measures adopted, how they are implemented and monitored. 描述所採納的職業健康與安全措施，以及相關執行及監察方法。	5.1.2
<b>B3 Development and Training</b> <b>B3 發展與培訓</b>		
General Disclosure 一般披露	Policies on improving employees' knowledge and skills for discharging duties at work. Description of training activities. 有關提升僱員履行工作職責的知識及技能的政策。描述培訓活動。	5.2.2
B3.1	The percentage of employees trained by gender and employee category (e.g. senior management, middle management). 按性別及僱員類別(如高級管理層、中級管理層等)劃分的受訓僱員百分比。	5.2.2
B3.2	The average training hours completed per employee by gender and employee category. 按性別及僱員類別劃分，每名僱員完成受訓的平均時數。	5.2.2



KPIs 指標	Description 指標描述	Disclosure 索引位置
<b>B4 Labour Standards</b> B4 勞工準則		
General Disclosure 一般披露	Information on: a) the policies and b) compliance with relevant laws and regulations that have a significant impact on the issuer relating to preventing child and forced labor. 有關防止童工或強制勞工的政策及遵守對發行人有重大影響的相關法律及規例的資料。	5.1.1
B4.1	Description of measures to review employment practices to avoid child and forced labour. 描述檢討招聘慣例的措施以避免童工及強制勞工。	5.1.1
B4.2	Description of steps taken to eliminate such practices when discovered. 描述在發現違規情況時消除有關情況所採取的步驟。	5.1.1
<b>B5 Supply Chain Management</b> B5 供應鏈管理		
General Disclosure 一般披露	Policies on managing environmental and social risks of the supply chain. 管理供應鏈的環境及社會風險政策。	4.3
B5.1	Number of suppliers by geographical region. 按地區劃分的供應商數目。	4.3
B5.2	Description of practices relating to engaging suppliers, number of suppliers where the practices are being implemented, how they are implemented and monitored. 描述有關聘用供應商的慣例，向其執行有關慣例的供應商數目、以及有關慣例的執行及監察方法。	4.3

KPIs 指標	Description 指標描述	Disclosure 索引位置
<b>B6 Product Responsibility</b> <b>B6 產品責任</b>		
<b>General Disclosure</b> <b>一般披露</b>	Information on a) the policies and b) compliance with relevant laws and regulations that have a significant impact on the issuer relating to health and safety, advertising, labeling and privacy matters relating to products and services provided and methods of redress. 有關所提供產品和服務的健康與安全、廣告、標籤及私隱事宜以及補救方法的政策及遵守對發行人有重大影響的相關法律及規例的資料。	4.2
<b>B6.1</b>	Percentage of total products sold or shipped subject to recalls for safety and health reasons. 已售或已運送產品總數中因安全與健康理由而須回收的百分比。	Not applicable 不適用
<b>B6.2</b>	Number of products and service related complaints received and how they are dealt with. 接獲關於產品及服務的投訴數目以及應對方法。	4.2.3
<b>B6.3</b>	Description of practices relating to observing and protecting intellectual property rights. 描述與維護及保障知識產權有關的慣例。	4.1.2
<b>B6.4</b>	Description of quality assurance process and recall procedures. 描述品質檢定過程及產品回收程式。	4.2.1
<b>B6.5</b>	Description of consumer data protection and privacy policies, how they are implemented and monitored. 描述消費者資料保障及私隱政策，以及相關執行及監察方法。	4.2.2
<b>B7 Anticorruption</b> <b>B7 反貪污</b>		
<b>General Disclosure</b> <b>一般披露</b>	Information on a) the policies and b) compliance with relevant laws and regulations that have a significant impact on the issuer relating to bribery, extortion, fraud and money laundering. 有關防止賄賂、勒索、欺詐及洗黑錢的政策及遵守對發行人有重大影響的相關法律及規例的資料。	1.4
<b>B7.1</b>	Number of concluded legal cases regarding corrupt practices brought against the issuer or its employees during the reporting period and the outcomes of the cases. 於彙報期內對發行人或其僱員提出並已審結的貪污訴訟案件的數目及訴訟結果。	1.4

KPIs 指標	Description 指標描述	Disclosure 索引位置
B7.2	Description of preventive measures and whistle-blowing procedures, how they are implemented and monitored. 描述防範措施及舉報程式，以及相關執行及監察方法。	1.4
<b>B8 Community Investment</b> <b>B8 社區投資</b>		
<b>General Disclosure</b> <b>一般披露</b>	Policies on community engagement to understand the needs of the communities where the issuer operates and to ensure its activities take into consideration the communities' interests. 有關以社區參與來瞭解營運所在社區需要和確保其業務活動會考慮社區利益的政策。	6.1 6.2
B8.1	Focus areas of contribution (e.g. education, environmental concerns, labour needs, health, culture, sport). 專注貢獻範疇(如教育、環境事宜、勞工需求、健康、文化、體育)。	6.1 6.2
B8.2	Resources contributed (e.g. money or time) to the focus area. 在專注範疇所動用資源(如金錢或時間)。	6.1 6.2

#### Investor Relations Department

##### 投資者關係部

Tel 電話: +852 3557 3000

Fax 傳真: +852 2635 1337

Email 電郵: ir@hanergythinfilmpower.com

Address: Room 2403A, 24/F, World Trade Centre,  
280 Gloucester Road, Causeway Bay, Hong Kong

地址: 香港銅鑼灣告士打道280號世貿中心24樓2403A室

