Guidance Notes for
Household-scale Solar Water Heating System
at Village House

July 2008
2008年7月
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1. **Scope**

1.1 This set of Guidance Notes (hereinafter referred to as "the Notes") provides general guidelines for the intending purchasers, owners and installers of household-scale solar water heating system installed at village houses to understand the installation requirements and application procedures associated with the installation, operation and maintenance of such solar water heating system. The Notes also provide an example arrangement of the pipework installation for a household-scale solar water heating system.

1.2 The Notes are for the general guidance and information. Government assumes no legal or other obligation in respect of the rights or interests of any intending purchaser, owner and installers. The issue of the Notes does not create any legal obligation or liability whatsoever on the part of Government.

1.3 The Notes should not be regarded as exhaustive. It is the responsibility of the intending purchasers, owners and installers to comply with relevant legal requirements.

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1. **範圍**

1.1 本指南為安裝在村屋的家庭式太陽能熱水系統的準買主、擁有人及安裝者提供指引，讓他們了解與安裝、操作和保養這類太陽能熱水系統有關的安裝規定及申請程序。本指南亦載有家庭式太陽能熱水系統喉管的其一例子布置圖。

1.2 本指南只作一般指引和提供資料之用，政府絕不因此為任何準買主、擁有人及安裝者的權利和利益，負上法律或其他責任。政府不會為刊印本指南或本指南內容而承擔任何法律義務或責任。

1.3 本指南並非巨細無遺。準買主、擁有人及安裝者有責任遵從有關的法例規定。
1.4 The intending purchasers, owners and installers may also make reference to the leaflet "Know more about Solar Water Heating System" about the principles of solar water heating system and overview of the basic components, types of systems and issues to be considered for installation. The leaflet can be downloaded from EMSD website (www.emsd.gov.hk/emsd/eng/pee/nre.shtml).

1.5 Regarding the installation of solar water heating system at low-rise houses other than the village houses, the intending purchasers, owners and installers shall consult an Authorized Person registered under the Buildings Ordinance, Cap. 123.

2. Terminology

<table>
<thead>
<tr>
<th>Terms</th>
<th>Definition</th>
</tr>
</thead>
</table>
| Approved loading   | The maximum current demand approved by an electricity supplier in respect of a fixed electrical installation.  
                      | 供電商就任何固定電力裝置允許的最高電流需求量。 |
| Authorized Person  | An architect, surveyor or engineer registered under section 3(2) of the Buildings Ordinance (Cap. 123).  
                      | 根據《建築物條例》（第123章）第3(2)條註冊的建築師、測量師或工程師。 |
| CoP                | Code of Practice for the Electricity (Wiring) Regulations  
<pre><code>                  | 《電力線路（規例）工作守則》 |
</code></pre>
<table>
<thead>
<tr>
<th><strong>Distribution board</strong>&lt;br&gt;配電箱</th>
<th>An installed group of fuses, switches, circuit breakers or other outlet points arranged inside a board enclosure for the distribution of electricity.&lt;br&gt;一組為配電而在箱形外殼內安排的經安裝的熔斷器、開關掣、斷路器或其他供電點。</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Electrical equipment</strong>&lt;br&gt;電力器具</td>
<td>Machines, transformers, apparatus, appliances, measuring instruments, protective devices, wiring materials, accessories, fittings and similar things, used for generation, conversion, transmission, distribution, control, measurement or utilization of electrical energy.&lt;br&gt;用以發電、將電能轉為其他能量、輸送電力、分配電力、調控電力、計量電力或利用電能的任何機械、變壓器、儀器、用具、計量工具、保護器件、線路裝設器材、附件、配件及類似物品。</td>
</tr>
<tr>
<td><strong>Electrical installation</strong>&lt;br&gt;電力裝置</td>
<td>An assembly of associated electrical equipment.&lt;br&gt;由互有關連的電力器具組合而成的設備。</td>
</tr>
<tr>
<td><strong>Electrical work</strong>&lt;br&gt;電力工程/電力工作</td>
<td>Work in relation to the installation, commissioning, inspection, testing, maintenance, modification or repair of a low voltage or high voltage fixed electrical installation and includes the supervision and certification of that work and the certification of design of that installation.&lt;br&gt;與低壓或高壓固定電力裝置的安裝、校驗、檢查、測試、維修、改裝或修理有關的工程或工作，包括監督工程、簽發工程證明書、簽發電力裝置設計證明書。</td>
</tr>
<tr>
<td><strong>Fixed electrical installation</strong>&lt;br&gt;固定電力裝置</td>
<td>A low or high voltage electrical installation that is fixed to premises but does not include any electrical equipment that is supplied with electricity after passing through a socket of the installation at which the supply can be disconnected without the use of a tool.&lt;br&gt;固定裝設在處所內的低壓或高壓電力裝置，但不包括從該裝置中的插座獲供電，而且無須使用工具即可在插座處截斷電力供應的任何電力器具。</td>
</tr>
<tr>
<td>Household-scale solar water heating system</td>
<td>A solar water heating system with a nominal size of one or more solar collector(s) integrated with a water tank of an overall size not exceeding 2.5m (in length) x 3.5m (in width) and a total gross weight not exceeding 700kg for a family dwelling. (Note: The household-scale solar water heating system is an assembly of equipment and shall not constitute an integral part of the village house. It should be easily dismantled and removed without causing undue damage to the village house.) 額定尺寸的太陽能熱水系統，由一個或以上的集熱器和一個儲水箱組成，而其整體尺寸不超過2.5米（長度）乘3.5米（闊度），總重量不超過700公斤，適合家庭住宅使用。 （注：家庭式太陽能熱水系統是由多個設備組合而成，並非村屋的組成部份。該系統的安裝和拆除須容易及不會對村屋造成損毀。）</td>
</tr>
<tr>
<td>Licensed plumber</td>
<td>A licensed plumber is a person licensed under the Waterworks Regulations to carry out various types of authorized plumbing work connected with the supply of water to domestic, commercial and industrial buildings. 持牌水喉匠是根據《水務設施規例》領有牌照者，可進行各種核准水管工程，使住宅、商業及工業樓宇獲得食水供應。</td>
</tr>
<tr>
<td>Owner</td>
<td>(a) A person who is in possession or control of an electrical installation; and (b) a person who holds premises in which an electrical installation is located, whether the premises are held under lease, licence or otherwise and includes an agent of that person and a tenant or occupier of premises. (a) 管有或控制電力裝置的人；及 (b) 以租約、准用約或其他方式持有電力裝置所在處所的使用權的人，包括該人的代理人及處所的租客或佔用人。</td>
</tr>
</tbody>
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**Guidance Notes for Household-scale Solar Water Heating System at Village House**

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| **Registered Electrical Contractor**  
| 註冊電業承辦商 | An electrical contractor registered under Section 33 of the Electricity Ordinance, Cap. 406.  
| | 根據《電力條例》（第406章）第33條註冊的電業承辦商。 |
| **Registered Electrical Worker**  
| 註冊電業工程人員 | An electrical worker registered under Section 30 of the Electricity Ordinance, Cap. 406.  
| | 根據《電力條例》（第406章）第30條註冊的電業工程人員。 |
| **Solar water heating system**  
| 太陽能熱水系統 | A hot water system incorporating equipment for absorbing heat in solar radiation to produce hot water.  
| | 一種熱水系統，裝有可吸收太陽輻射的熱能以產生熱水的設備。 |
| **Stairhood**  
| 樓梯頂篷 | A structure of a village house on the roof area of not more than 7.44 m², a height of not more than 2.14 m and is erected and used solely to provide protection from rain and sun for a stairway used to gain access to the roof of the building.  
| | 在村屋屋頂的結構物，其上蓋面積不超過7.44平方米，高度不超過2.14米，而興建該樓梯頂篷只供為一幢通往該建築物天台的樓梯遮擋雨水及陽光之用。 |
| **Village house**  
| 村屋 | A New Territories exempted house with a roofed-over area not exceeding 65.03 m², and a height not exceeding 8.23 m and not more than three storeys, which is exempted/ permitted under the Buildings Ordinance (Application to the New Territories) Ordinance, Chapter 121.  
| | 根據《建築物條例（新界適用）條例》（第121章）獲豁免准許的新界豁免管制樓宇，其上蓋面積不超過65.03平方米，高度不超過8.23米，及不超過三層。 |
3. Introduction

Solar water heating systems harness the heat in solar radiation to produce hot water. A household-scale solar water heating system comprises one or more solar collector(s), a water tank and interconnecting pipework. The solar collectors are usually mounted on the roof of a building to capture solar radiation.

The solar collectors absorb the heat in solar radiation and transfer the heat energy to the water either directly or indirectly. The hot water so produced is stored in a well-insulated storage tank to hold the solar heated water for subsequent use. Usually a solar water heating system is designed to fulfill a major part of the hot water requirements of the premises, with the rest being made up by other heating sources such as an electric heater.

4. General Requirements

(a) Household-scale solar water heating system should be designed to relevant national / international standards or specifications, and so certified by the recognized national / international organizations or relevant testing and certification authorities.

(b) Relevant technical standards for solar water heating system are listed in Appendix 1 for reference.

3. 引言

太陽能熱水系統利用太陽輻射的熱能來產生熱水。家庭式太陽能熱水系統由一個或多個集熱器、一個儲水箱和傳導管組成。集熱器通常安裝在屋頂上以獲取充足太陽輻射。

太陽能集熱器能夠吸收太陽輻射的熱能，直接或間接加熱食水，而產生的熱水則儲存於隔熱性能優良的儲水箱，供隨後使用。通常太陽能熱水系統在設計時已預計可供應安裝處所本身大部分的熱水需求，不足的部分則由其他熱源（例如電力加熱器）補足。

4. 一般規定

(a) 家庭式太陽能熱水系統須按照有關國家/國際標準或規格來設計，並獲得認可國家/國際機構或有關測試及認證當局簽發證明書。

(b) 與太陽能熱水系統有關的技術標準載於附錄 1，以供參閱。
5. Installation Requirements

A summary of the installation requirements for a household-scale solar water heating system is listed below.

(a) General: A solar water heating system should be installed on the roof-top of a village house which should be a structurally sound area and this area should be unshaded from adjacent structures, buildings and trees. The solar collector panel(s) should be tilted at a suitable angle and properly oriented in accordance with the manufacturer’s recommendations so as to maximise the year-round efficiency. An example installation arrangement of a household-scale solar water heating system on the roof-top of a village house is shown in Appendix 2 for reference.

(b) Solar water heating system with electrical components: For a solar water heating system incorporating with electrical components (e.g. electric heater and pump etc.), it should be issued with a certificate of safety compliance. A sample certificate is attached in Appendix 3 for reference. The owner should employ a Registered Electrical Contractor / Registered Electrical Worker (REC/REW) to carry out the installation work.
(c) Plumbing requirements: The owner should employ a licensed plumber to carry out installation or modification of water supply system for the solar water heating system. The work of the licensed plumber should include piping design and installation for the system. For ease of reference, an example arrangement of the pipework installation for a household-scale solar water heating system is shown in Appendix 4.

(d) Structural requirements: A general household-scale solar water heating system would have a range of dimensions and weight from around 2m (L) x 1m (W) and 300kg to 2.5m (L) x 3.5m (W) and 700kg respectively. In general, the roof-top area of a typical village house is able to support the solar water heating system up to the above largest dimensions and weight and as prescribed in Appendix 2. The system mounted on the supporting frame supplied with the system shall be installed on the roof-top area (except the area on the top of canopy and stairhood) of a village house. However, the owner and the installer of the system are advised to consult building professionals on the structural loading capacity of their village houses.
6. Application Procedures

A summary of the application procedures for installation of a household-scale solar water heating system is listed below for reference.

(a) Solar water heating system with electrical components: No prior approval to the equipment or installation work is required.

(b) Plumbing installation: The owner of a solar water heating system should consult a licensed plumber upon the submission of an application to the Water Supplies Department (WSD). Like other storage type water heaters, the licensed plumber will represent the owner to submit the associated plumbing proposals together with the completed application form to the WSD.

(c) Land Lease Conditions: The installation of a solar water heating system on the roof-top of a village house may constitute a breach of the lease conditions. However, as long as the proposed installation is in accordance with the prescribed dimensions and weight and the requirements provided herewith, such installation can be tolerated and no application for toleration is required.

6. 申請程序

現把安裝太陽能熱水系統的申請程序扼述如下，以供參閱：

(a) 配有電氣組件的太陽能熱水系統：設備或安裝工作無須事先得到批准。

(b) 單管裝置：太陽能熱水系統的擁有 人在向水務署提交申請時，應徵詢持牌單管裝置器的意見。持牌水喉匠會代表擁有人把相關的喉管建議書連同已填妥的申請表格送交水務監督，做法一如其他儲水式熱水器那樣。

(c) 土地批約條款：在村屋的天台安裝家庭式太陽能熱水系統可能違反批約條款。不過，只要擬議裝置符合本指南所訂明的尺寸及重量及所載的規定，則有關裝置可予暫准，而且無須為此暫准提交申請。
7. Operation and Maintenance

(a) The owner of a household-scale solar water heating system should follow the operation and maintenance instructions as specified in the installation guidelines and technical manuals given by the manufacturer/supplier. The owner should properly store and keep all the technical documents for future reference.

(b) The owner should arrange regular inspection and routine maintenance including functional check of the solar water heating system in accordance with the technical documents provided by the manufacturer/supplier.

(c) The owner shall avoid idling the solar water heating system for a long period of time for prevention of stagnant water and loss of chlorine in the water.

7. 操作及維修

(a) 家庭式太陽能熱水系統的擁有人必須遵從製造商/供應商提供的安裝指引及技術手冊內所載的操作及維修指示。擁有人必須妥善儲存及保管所有技術文件，以供日後參考之用。

(b) 擁有人須按照製造商/供應商提供的技術文件所述，安排對太陽能熱水系統進行定期檢驗及例行維修，包括檢查系統各項功能。

(c) 擁有人不宜長期不使用太陽能熱水系統，以免系統存有死水及水中的氯氣流失。
8. Enquiries

(a) General Information:
Electrical and Mechanical Services Department
3 Kai Shing Street, Kowloon, Hong Kong
Tel. : 2808 3465
Fax  : 2890 6081
Email : eepublic@emsd.gov.hk
Website: www.emsd.gov.hk

(b) Plumbing Consideration:
Water Supplies Department
43/F Immigration Tower
7 Gloucester Road, Wanchai, Hong Kong
Tel. : 2824 5000
Fax  : 2824 0578
Email : wsdinfo@wsd.gov.hk
Website: www.wsd.gov.hk

(c) Building Consideration:
(i) Lands Department (for village houses)
20/F North Point Government Offices
333 Java Road, North Point,
Hong Kong
Tel. : 2231 3294
Fax  : 2868 4707
Email : landsd@landsd.gov.hk
Website: www.lands.gov.hk

(ii) Buildings Department (for low rise buildings other than village houses)
12/F Pioneer Centre,
750 Nathan Road, Kowloon,
Hong Kong
Tel. : 2626 1616
Fax  : 2537 4992
Email : enquiry@bd.gov.hk
Website: www.bd.gov.hk

8. 查詢

(a) 一般資訊
香港九龍啟成街3號
機電工程署
電話號碼 : 2808 3465
傳真號碼 : 2890 6081
電郵地址 : eepublic@emsd.gov.hk
網 址 : www.emsd.gov.hk

(b) 水務事宜
香港灣仔告士打道7號
入境事務大樓43樓
水務署
電話號碼 : 2824 5000
傳真號碼 : 2824 0578
電郵地址 : wsdinfo@wsd.gov.hk
網 址 : www.wsd.gov.hk

(c) 樓宇事宜
(i) 地政總署（村屋）
香港北角渣華道333號
北角政府合署20樓
電話號碼 : 2231 3294
傳真號碼 : 2868 4707
電郵地址 : landsd@landsd.gov.hk
網 址 : www.lands.gov.hk

(ii) 屋宇署（除村屋外的低層樓宇）
香港九龍彌敦道750號
始創中心12樓
電話號碼 : 2626 1616
傳真號碼 : 2537 4992
電郵地址 : enquiry@bd.gov.hk
網 址 : www.bd.gov.hk
Appendix 1

Reference may be made to the following technical standards for better applying and understanding of the requirements of solar water heating system.

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard No.</th>
<th>Description</th>
</tr>
</thead>
</table>
| 1.   | ISO 9806     | Test methods for solar collectors  
                 太陽能集熱器的試驗方法 |
| 2.   | ISO 9459     | Solar heating - Domestic water heating systems  
                 太陽能加熱—家用熱水系統 |
| 3.   | BS 5918      | Solar heating systems for domestic hot water  
                 供應家用熱水的太陽能加熱系統 |
| 4.   | EN 12975     | Thermal solar systems and components - Solar collectors  
                 太陽能系統和組件—太陽能收集器 |
| 5.   | EN 12976     | Thermal solar systems and components - Factory made systems  
                 太陽能系統和組件—工廠預製系統 |
| 6.   | ENV 12977    | Thermal solar systems and components - Custom built systems  
                 太陽能系統和組件—特別訂造系統 |
| 7.   | GB/T 6424    | Specification for flat plate solar collectors  
                 平板型太陽集熱器技術條件 |
| 8.   | GB/T 17049   | All-glass evacuated solar collector tubes  
                 全玻璃真空集熱管 |
| 9.   | GB/T 4271    | Test methods for the thermal performance of flat plate solar collectors  
                 平板型太陽集熱器熱性能試驗方法 |
| 10.  | GB/T 17581   | Evacuated tube solar collector  
                 真空管太陽集熱器 |

If a solar water heating system is incorporated with independent electrical heating device(s), it should also be designed to relevant international safety standards (such as IEC60335-1 in conjunction with IEC60335-2-21 or equivalent) and so certified by an accredited testing laboratory.

附錄1

如欲更了解有關太陽能熱水系統的規定及加以應用，可參考下列技術標準：
Appendix 2

Solar Water Heating System on Flat Roof of Village House

設在村屋天台的太陽能熱水系統

在村屋安裝的家庭式太陽能熱水系統指南
<table>
<thead>
<tr>
<th>Size</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Largest size</strong></td>
<td><strong>2.5m (L 長) × 3.5m (W 闊)</strong> approx. 700kg 大約</td>
</tr>
<tr>
<td><strong>Typical size for a 4-member family</strong></td>
<td><strong>2.5m (L 長) × 2.5m (W 闊)</strong> approx. 400kg 大約</td>
</tr>
</tbody>
</table>
Example arrangement of the pipework installation for a Household-scale Solar Water Heating System

附錄4
家庭式太陽能熱水系統的管道佈置圖
Notes:

1. Type of piping materials to be used at the water supply system should be specified and shall comply with Hong Kong Waterworks Ordinance and Hong Kong Waterworks Regulations.

2. Size of piping should be specified and should be adequately designed.

3. It is advisable that lagged copper pipes are used for hot water system where recirculation system is designed.

4. In order to obviate the risk of scalding, the hot water draw-off point should be mixed with cold water supply.

5. An isolation valve and non-return valve must be installed on the cold water pipe to the water heater.

註：

1. 應指明供水系統喉管採用的物料種類，有關物料必須符合《水務設施條例》及《水務設施規例》的規定。

2. 應指明喉管尺寸及妥善設計喉管。

3. 在設計再循環系統時，應為熱水系統採用絕熱銅管。

4. 為免有燙傷風險，熱水應在熱水出水點與冷水混合。

5. 冷水喉管至熱水爐之間應裝上隔離閥及止回流閥。
Amendment of paragraph 5(d) in page 9 of the “Guidance Notes for Household-scale Solar Water Heating System at Village House”

5(d) Structural requirements: A general household-scale solar water heating system would have a range of dimensions and weight from around 2m (L) x 1m (W) and 300kg to 2.5m (L) x 3.5m (W) and 700kg respectively. In general, the roof-top area of a typical village house is able to support the solar water heating system up to the above largest dimensions and weight and as prescribed in Appendix 2. The system mounted on the supporting frame supplied with the system shall be installed on the roof-top area (except the area on the top of canopy and stairhood) of a village house. If the equipment is installed on the main roof, the average loading imposed should not exceed 150 kg/m². If the equipment is installed on the roof of stairhood, the average loading imposed should not exceed 75 kg/m². However, the owner and the installer of the system are advised to consult building professionals on the structural loading capacity of their village houses.

「在村屋安裝的家庭式太陽能熱水系統指南」第 9 頁 5(d)段須作以下修訂：
5(d) 結構規定：一般家庭式太陽能熱水系統的呎吋及重量分別大約由 2 米長 x 1 米闊及 300 公斤重至 2.5 米長 x 3.5m 米闊及 700 公斤重。而一般典型村屋的天台範圍能夠支承以上最大面積及重量的家庭式太陽能熱水系統，見附錄 2。系統必須安裝在村屋的天台範圍（簷篷頂部及樓梯頂篷蓋上的範圍除外），並須裝設在隨系統供應的支架上。若有關設備安裝在屋頂上，該設備的平均荷載不得超過每平方米 150 公斤。若有關設備安裝在樓梯頂篷上，該設備的平均荷載不得超過每平方米 75 公斤。不過，家庭式太陽能熱水系統的擁有人及安裝者應就其村屋的結構承載能力徵詢建築專業人士的意見。