#8/2002

IEA PVPS 執行委員会
ソフィアアンティポリス会議
出張報告書

As of October 21, 2002

Ⅰ．全体事項

１．所属・氏名

東京農工大学工学部電気電子工学科　黒川浩助

２．渡航目的

太陽光発電技術研究組合からの依頼により，フランス・ソフィアアンティポリスにおいて「IEA/PVPS 第 20 回執行委員会」へ出席し，渡航者が運営責任者を務めるタスクⅧの進捗状況などを報告・協議する。

３．出張期間・渡航地

平成 14 年 10 月 13 日～平成 12 年 10 月 19 日　フランス・ソフィアアンティポリス

４．会議場所・期間

場所：

① 平成 14 年 10 月 14 日(月)午前　IEA タスク運営責任者会議（OA ミーティング）：ADEM
② 平成 14 年 10 月 14 日(月)午後　IEA PVPS ExCo ワークショップ：ADEM
③ 平成 14 年 10 月 14 日(月)夕刻　パリ国立高等鉱山学校エネルギー工学センター見学会
the Energy Engineering Centre, Ecole des Mines de Paris, Sophia Antipolis
④ 平成 14 年 10 月 15～16 日（火～水）　IEA 太陽光発電研究協力実施協定執行委員会（IEA PVPS ExCo）：国立建物科学技術センターCSTB 会議室
CSTB: the National Scientific and Technical Centre for Buildings, Sophia Antipolis
⑤ 平成 14 年 10 月 17 日(木)午前　IEA-コンファレンス実施協議：アンチーブ・ロイヤルホテル会議室

５．会議概要

5.1 全体概要

国際エネルギー機関 IEA の政府間共同研究活動である太陽光発電研究協力実施協定 PVPS に基づく執行委員会 ExCo 会議にタスク８運営責任者 OA として出席した。

5.2 OA 会議概要

OA ミーティングは各タスク OA の ExCo に対する事前準備協議で，タスク間の共通課題を抽出し ExCo へ報告する。

Jacquin 氏より ExCo への報告・審議事項に関する意見が要請され、整理された。

①　スペインの各タスクへの参加が停止状態である。

② 各タスクと実施協定本体の延長手順において，カクタス区の経験を生かしたボトムアップをトップダウンと併用してほしい。
③ 実施協定終了報告 End-of-Term Report については，この 10 年間で Communication 環境が変化し、対象階層の範囲も拡大したが、そのような観点が含まれていない。
④ 各タスク会合の開催間隔は前半は多く、後半は少なくしても良いのでは。サブタスク Meeting を開催する場合もあり（Task IX)。
⑤ 次回 OA 会議 Chair は、Dahl 氏（Task II）となった。

5.3 ExCo **ワークショップ： 10 月 14 日（月）**14:00〜18:00

(1) 米国ストラテジー・アンリミテッド社ジョンソン氏セミナー講演
Strategies Unlimited : Robert O. Johnson
講演趣旨は世界の太陽光発電市場に於ける産業開発，技術開発，市場成長であった。

(2) タスク１０：都市型太陽光発電応用
Proposed Task 10: Urban-scale PV Applications presented by Harry Schaap
オーストラリア・シャープ氏（ExCo 副委員長）のプレゼンにより，新規提案中のタスク 10：都市型太陽光発電応用についてワークプランのブラッシュアップのための討論をした。ExCo 本会議に審議に先立つ予備会議となった。

5.4 パリ高等鉱山学校 Ecole des Mines de Paris エネルギー工学センター施設調査

10 月 14 日（月）18:00〜19:30
同センターは分散型発電分野について，システム研究を実施するとともに，エネルギー利用を想定した材料技術分野の研究開発も実施している。今回の見学では，①PV 用貯蔵のための水素電解装置＋燃料電池の実験装置，②PV/DG 実験装置，③遠隔地用燃料電池実験装置，④プラズマによるナノ・カーボン連続製造装置（フラーレン系）について各担当研究者から詳しい説明を受けた。

5.5 ExCo **本会議の概要** 10 **月** 15 **日（火）**9:00〜16 **日（水）**16:45

(1) **概要**
① 第 20 回 ExCo 会議が、ADEME (France) のホストにより開催された。・ IEA:Wide 氏より IEA および REWP の戦略に関する講演がなされた。
② PVPS Implementing Agreement の End-of-Term レポート(1998-2002)が承認された。
③ また、PVPS の次期戦略について議論がなされた。議論の結果を踏まえ、オーストラリア､米国､カナダおよびイギリスの ExCo メンバーにより Drafting されることとなった。
④ タスク 7 の活動終了が承認された。一方、タスク 5 については Management レポートおよび一部テクニカルレポートの最終版が提出されておらず、状況の確認が要請された。
⑤ タスク 10 のワークプラン案について議論がなされた。今後、以下の国々の ExCo メンバーによりワークプラン案が完成されることとなった。オーストラリア、カナダ、米国、スウェーデン、オーストリアおよびイギリス。

(2) Task 8 **評価関係**
① イスラエル ExCo メンバー(Arbib 氏)によりタスク 8 についての内部評価結果が報告された。
② 現行ワークプランの最終段階となっていることから、報告書案に対する要改善事項の抽出、活動継続の提案に対する承認判断の助けとすることを目的として評価。
③ 目的、成果物などは明確であるが、ターゲットグループが明確に定義されていないため、第二フェーズでは要改善。
④ 非常に効率的に運営され、多くの作業が実施されており、特に三つのケーススタディはこれまでには得られていなかった成果。
⑤ 活動成果をより有用とするためには、もう少しの努力が必要。
⑥ 報告書に対するコメントの一部は既に反映済で、未反映の部分は第二フェーズで検討する旨、加藤氏より述べられた。

(3) Task 8 **最終報告書の出版原稿**

① (3) 最終報告書の出版原稿が承認された。PVPS ロゴの扱いなどについては、James & James 社による Editing の段階で、chair（Nowak 氏）、vice chair(Schaap 氏)に確認・校正等を依頼することとなった。
② 国際シンポジウム（2003 年 5 月 18 日：WCPEC-3 サイドイベント）
③ 活動延長／ワークプランについては活動の延長が基本的に承認された。タスク評価の結果等を踏まえた改訂ワークプランを作成し、次回 ExCo にて再度提案するよう要請された。

(4) Task 8 **国際シンポジウム**
① 会議次第については了承された。
② WB や GEF に対する Invitation は注意が必要との指摘があった。

(5) PVPS Conference **開催案**
① NEDO 加藤氏より、PVPS Conference のコンセプトペーパー案が提示され、承認された。
② 開催期間：2003 年 5 月 19-20 日（at 大阪）

(6) **次回** ExCo **会議予定**
① 次回(第 21 回)：2003 年 5 月 21-22 日　大阪にて
② 次々回(第 22 回)：2003 年 10 月 20-22 日　ドイツ（ベルリンまたはユーリッヒ）にて

6．OA **会議**(Task 2 OA: Philippe JACQUIN **氏が議長)：** 10 月 14 日（月）9:00～12:00

6.1 **日　時 ：**2002 **年** 10 **月** 14 **日(月)** 9:00**～**11:20

6.2 **場　所 ：**ADEME, Sophia Antipolis, France

6.3 **出席者**

G.Watt	(	Task I,	AUS)
R.Dahl	(	Task II,	GER)
P.Jacquin	(	Task III,	FRA, Chair)
加藤	(	Task VIII,	JPN (NEDO))
黒川	(	Task VIII,	JPN (東京農工大))
原田	(	Task VIII,	JPN (PVTEC))
河本	(	Task VIII,	JPN (富士総研))
B.McNelis	(	Task IX,	GBR)
B.Hassett	(	ExCo,	USA)

6.4 **各タスクの特定問題**

(1) Task 1
① ISR：外部編集委託は止めて，自分たちで作成したほうが効率的で予算節約にもなると思う。
② Task 1 の調査について国レベルの対応を望む。陳腐な返答が混じっている。
③ ISR などの各国言語への翻訳（日本の対応は評価されている）。
④ 刊行物を，ハードコピーのままとするか，ダウンロード方式とするか？
⑤ 特定調査研究分野は，分散型連系システム，建物一体型，付加価値である。

(2) Task 2
① 参加メンバーが依然減少。

(3) Task 3
① タスクへの参加者に対する強力なサポートが不足している。

(4) Task 8
① スペイン，イタリア不参加。
② それ以外は，うまく動いている。
③ タスクの継続処理。

(5) Task 9
① タスク継続の問題

(6) Task 10
① 新タスクの OA はオーストラリアが準備中。
② OA の資金手当てがまだできていない。
③ コンセプトペーパーを固めるのにまだ時間がかかるかもしれない。

6.5 IEA PVPS 実施協定終了報告 EOT Report

(1) 最近 5 年間の達成成果の公式報告である。
(2) 外部の視点
① 本実施協定の結果を IEA はどう使うか？... CERT - REWP - PVPS
② タスクに参加することの有効性は何なのか？
(3) 内部の視点
① 各種活動の集約化がされていない。
② 次期計画；タスク参加者に利害関係者が少なく R&D 系の参加者が多いという現実。
③ 経済性（コストや価格）に関してもっと志向すべき。
④ 参加各国内での地域言語での国内委員会設立の必要性。
⑤ OA は参加専門家を直接選択できない。

6.6 各タスクの開催計画

	2003-I	2003-II	Note
Task 1	March 5-7, London	Sept. 10-12, Stockholm	
Task 2	19-20 March, Sophia	Sept. 10-12, Berlin	
Task 3	March 24-26 2003, Morges, CH	Sept. 2nd week, Kassel, DE	
Task 8	July 4-5, Paris		May 18, International Symposium, Osaka
Task 9	March 24-26, Vietnam	Sept., West Africa	
Task 10			

6.7 その他の討論

① ExCo メンバーとＯＡとの会話・情報交換
② この 10 年間に社会環境が変質した。頻繁な旅行よりも情報通信手段が有効になった。
③ 目標読者も，電気事業/政府関係者から建築家まで広範囲になってきた。
④ これらの観点が現在の EOT ドラフトに抜けている。
⑤ IEA は IDEA に成っていないか。(International Drinking and Eating Egency)
⑥ とくにタスク初期には face-to-face も重要なので，初期は時々会い，5 年後にはまばらに会合を開催すほうが有効ではないか。

6.8 ExCo への報告事項

① スペインの再参加問題は各タスクに共通。
② IEA PVPS の延長とタスクの継続処理手順の明確化（ExCo と各タスクに共通）。
③ Task 1 調査の結果から，TARGET AUDIENCE の関心事項についてあたらしい情報を得ることができた。新しい PVPS 戦略文書策定のときに，トップダウンだけでなくボトムアップ・アプローチも考えてもらいたい。ExCo，タスク共通，特定タスクに対する顧客/ユーザー，利害関係者/目標読者の各々の関心を織り込むべきである。

6.9 次回 OA ミーティング議長

Task 2 OA: R. Dahl for May 19-22, 2003, Osaka

7. ExCo ワークショップ：10 月 14 日（月）13:30～18:00

7.1 米国ストラテジー・アンリミテッド社ジョンソン氏セミナー講演

Strategies Unlimited : Robert O. Johnson

(1) 配布資料：copy of slideshows
(2) 講演趣旨：産業開発，技術開発，市場成長
(3) 講演概要
① 世界の太陽光発電市場は，上位４社が 61%生産している：Sharp, Kyocera，BP Solar, Siemens/Shell Solar。
② 近未来で可能性のある企業；エバーグリーン，荏原ソーラー，三洋，三菱重工，デュナソーラー。
③ 潜在的次世代：パシフィックソーラー，昭和シェル，エルソーラー，ビュルトソーラー，ファーストソーラー，グローバーソーラーエネルギー，アンテックソーラー，セオソーラー，カルソーラー。
④ ブレークスルーを見込まない場合のコスト回帰による今後の 10 年を予測した。1990 のスタグフレーション期にはＣｚが盛り返した。
⑤ 薄膜はの実用機は間近いが，しかし，プロセスの再現性，コスト低下などのに問題もある。
⑥ 大型モジュール化の傾向は続く，
⑦ 現状の市場は 60%が連系型システムである。
⑧ 屋根一体型よりも，屋根置き型アレイが圧倒的に多い。
⑨ PV 建物について各地域の状況がシフトしている。
・欧州・ドイツ　－　前線から消えつつある
・日本　－　育成策の過渡期
・カルフォルニア，ＵＳに対する新しい焦点
・新ミレニアムのエネルギーソリューション
・エネルギー将来のコントロール　－　主要な便益となる
⑩ 世界エネルギーの基調として，先進国はＬＮＧへ移行していく。
⑪ 1995-2010 年の長期ＰＶ見通しについて堅めの予測を語った。ＢＡＵケースでは：1872 MW，加速ケースでは：4123MW。

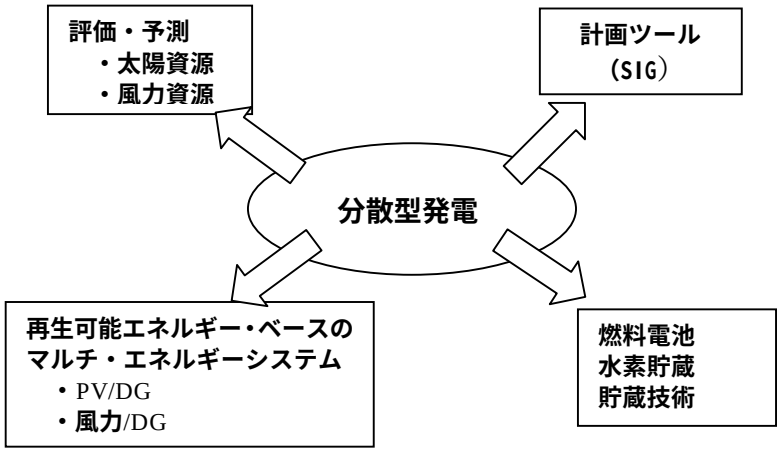
7.2 タスク１０：都市型太陽光発電応用

Proposed Task 10: Urban-scale PV Applications presented by Harry Schaap

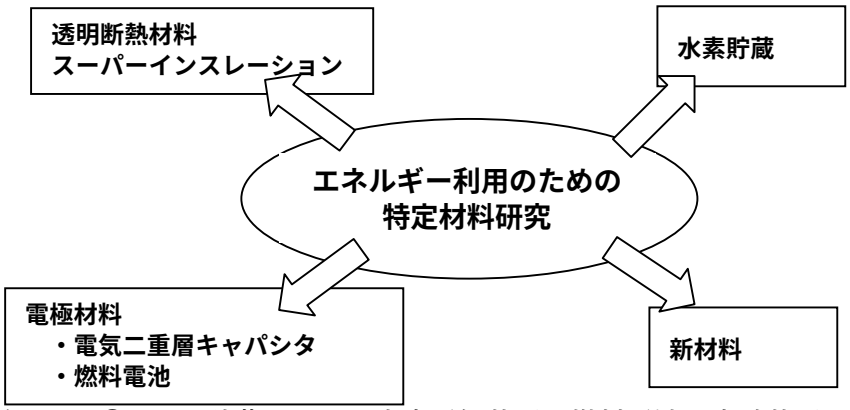
(1) オーストラリア・シャープ氏（ExCo 副委員長）の講演により，新規提案中のタスク１０：都市型太陽光発電応用についてワークプランのブラッシュアップのための討論をした。
(2) 以下に講演の概要を述べる。
① 国際協調体制で，都市地域での連系型太陽光発電の幅ひろい応用について，国家レベルのプロジェクトの情報を収集することを目的としている。特別のプラントを作るのが目的でない。
② 主要な利害関係セクター（12 セクターをリスト）を考慮し，その必要な情報を摘出することにより，調査対象分野を選定し，これらをタスク１０の活動分野に当てていく。
Interest area 1 - Planning, design & development
Interest area 2 - Technical factor, engineering, interconnection, utility issues
Interest area 3 - Economics & institutional factors, finance/client, insurance, policy issues
Interest area 4 - Targeted information development & dissemination, FAQs, videos, databases, ...
③ 考慮すべき次の課題は，具体的に参加国を決め OA を任命することである。また，サブタスクリーダー制でなく，特定の分野に関心を持つ専門家による分野リーダー制を採用したらよい。
(3) 以下は質疑応答：
Q：international added value があるか？(Nowak)
Ｃ：area 3 に market issue がない。

C：国際的な付加価値がある。task 7 **のような成果物は価値が高い：**CD-ROM, Internet, Reports, ... (Lisa, Canada):
C：範囲が広すぎる。もっと絞るべきではないか。
A：priority area **は未検討である。**
結論：水曜日に各国の意見を徴取する。

7.3 パリ高等鉱山学校 Ecole des Mines de Paris エネルギー工学センター施設調査 18:00〜19:30
(1) エネルギー工学センターの研究分野

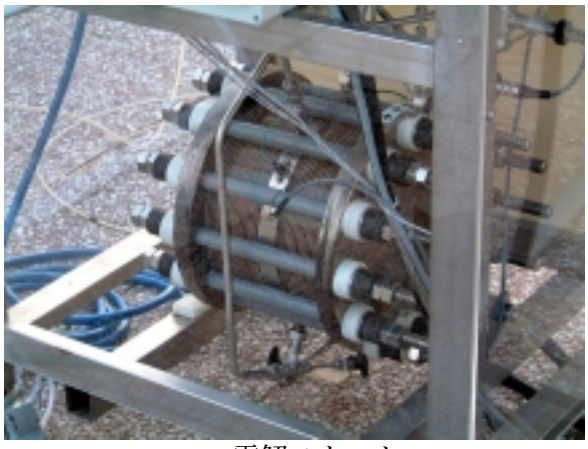


同センターは分散型発電分野について，図のようなシステム研究を実施するとともに，下図のようなエネルギー利用を想定した材料技術分野の研究開発も実施している。

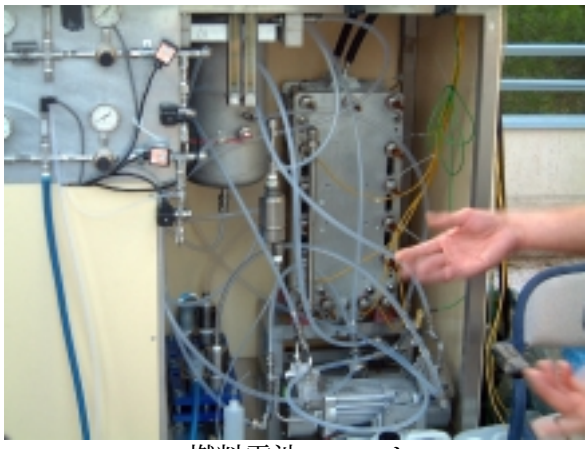


(2) 今回の見学では，①PV 用貯蔵のための水素電解装置＋燃料電池の実験装置，②PV/DG 実験装置，③遠隔地用燃料電池実験装置，④プラズマによるナノ・カーボン連続製造装置（フラーレン系）について各担当研究者から詳しい説明を受けた。

太陽光発電実験装置



電解スタック



燃料電池ユニット

自動車用燃料電池実験装置（日本製）

8. 第20回 ExCo 会議: 10 月 15 日(火)9:00～16 日(水)16:45

8.1 日　時 :2002 年 10 月 15 日(火) 9:00～18:00
2002 年 10 月 16 日(水) 9:00～16:45

8.2 場　所 :CSTB, Sophia Antipolis, France

8.3 参加者:(敬称略)

S.Nowak	(ExCo, chair	CHE	)
M.Brunisholz	(Executive secretary		)
H.Schaap	(ExCo, vice chair	AUS	)
A.Claverie	(ExCo	FRA	)
R.Hassett	(ExCo	USA	)
R.Öström	(ExCo	EU	)
P.Lund	(ExCo	FIN	)
L.Dignard-Bailey	(ExCo	CAN	)
P.Sassetti-Paes	(ExCo	POR	)
S.Castello	(ExCo (alternate)	ITA	)
F.Kristensen	(ExCo	DEN	)
A.Arbib	(ExCo	ISR	)
橋本	(ExCo	JPN (NEDO)	)
木村	(	JPN (NEDO)	)
M.Malmkvist	(ExCo	SWE	)
G.Shanahan	(ExCo	GBR	)
K.Madsen	(ExCo	NOR	)
H.Fechner	(ExCo	AUT	)

C.Hunnekes	(	ExCo	GER	)
J.Swens	(	ExCo (alternate)	NLD	)
J.Wide	(		IEA	)
S.M.Pietruszko	(		POL	)
G.Watt	(	Task I OA	AUS	)
R.Dahl	(	Task II OA	GER	)
P.Jacquin	(	Task III OA	FRA	)
加藤	(	Task VIII OA	JPN (NEDO)	)
黒川	(	Task VIII OA	JPN (東京農工大)	)
原田	(	Task VIII	JPN (PVTEC)	)
河本	(	Task VIII	JPN (富士総研)	)
B.McNelis	(	Task IX OA	GBR	)

8.4 配布資料(当日):

- Item 7 : IEA Secretariat Report to Fall 2002 Executive Committee Meetings of Renewable Energy Implementing Agreements, 2 September 2002, Paris France
- Item 7:IEA Secretariat Report, PVPS IA ExCo Meeting, 15-16 October 2002, Sophia Antipolis, France(スライドコピー)
- Item 7:Renewable Energy Working Party, Draft Agenda for the Forty-second Meeting, 14-16 October 2002, INETI Facilities, Lisbon, Portugal
- Item 13.1 -Task VIII :A Desert Produces Energy (Executive Summary 部分抜粋)
- Item 13.1 -Task VIII :PV Vision: The Very Large-Scale PV System Concept, PV in Europe, 7-11 October 2002, Rome:Task VIII (黒川教授)
- Item 13.2 -Task IX : Financing Mechanisms for Solar Home System in Developing Countries, Report IEA-PVPS T9-01:2002 (CD-ROM)
- Item 14 -Task VII :Designing with Solar Power, A Source Book for Building Integrated Photovoltaics [BiPV]
- Item 16 -Task III :Use of Appliances in Stand Alone PV Power supply systems, Report IEA PVPS T3-09:2002 (CD-ROM)
- Item 16 -Task III :Testing of Batteries used in Stand Alone PV Power Supply Systems, Report IEA PVPS T3-11:2002 (CD-ROM)
- Item 16 -Task III : Use of photovoltaic power systems in stand-alone and island applications (Brochure)
- Item 19:Proposed Task 10, Urban-scale PV Applications（スライドコピー:Workshop at 'PV in Europe', 7 October 2002）
- Item 19:General comments on the state of development of Task 10（comments from Workshop at 'PV in Europe', 7 October 2002）
- 3rd World Conference on Photovoltaic Energy Conversion, 2nd Announcement, Call for papers
- ISES 2003, Solar Energy for a Sustainable Future, 14-19 June 2003, Göteberg, Sweden (Invitation)
- Pacific Solar, 2002 Annual Report

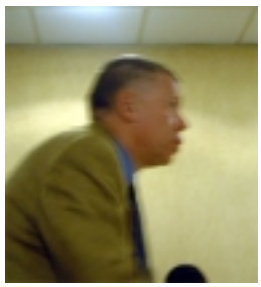
8.5 議 事 :

(1) 開会および主催者挨拶

① Nowak 氏による開会の挨拶に引き続き、ホストであるフランス：ADEME より歓迎の挨拶がなされた。

② フランス PV は現在，14MW 市場。今までは独立システム中心 4.6 Euro/W の補助金 ＋ 買い上げ料金 Feed-in tariff 15 c/kWh（本土）あるいは 30 c/kWh（コルシカ・島部）によって導入支援されている。

② 連系システムもはじめた。



(2) 参加者の確認･ExCo 新メンバー

① IEA 事務局：Johan Wide

② 日本：橋本氏

③ UK：
④ Austria：Hubert Fechner
⑤ オランダ：Novem
⑥ イタリア：Cosi
⑦ EC TREN
⑧ 出席者より簡単な自己紹介がなされた。また、Nowak 氏より ExCo メンバーの欠席国が報告された。韓国，メキシコが欠席。

ExCo 議長席

(3) 議事の確認

議事案が承認された。

(4) 前回議事録の確認

前回議事録(Cuernavaca, Mexico, 2002.4)が承認された。

(5) ExCo メンバーの交代

Nowak 氏より、今回が初参加となる ExCo メンバーが報告された。

① 日本、イギリス、オランダおよびイタリアのメンバーは今回が初参加

(6) PVPS への参加、加盟に関する状況

① Nowak 氏より以下の事項が報告された。
② スペイン：後任となる機関が決まっていない。
③ オーストリア：メンバーとなる機関(contract party)が変更となり、手続き中である。
④ トルコ：
⑤ インド：交渉を継続しているが、特に進展はない。このところ連絡なし。
⑥ 中国／香港：
⑦ ポーランド：IEA への加盟に向けて調整中である。DOE 大臣が IEA 加入申請。受託後に PVPS に参加する。
⑧ ギリシャ：参加に興味を示している。今回は出席できなかったが、次回は参加の予定。

(7) IEA および REWP に関する事項

① Wide 氏(IEA)より、IEA、REWP の戦略が報告された。
② 当面の討論課題は：
- Suggested approach for effective future IEA support of Implementing Agreements
- REWP Strategic agenda for market facilitation: update summary
- REWP International Renewable Energy R&D Symposium (3 March 2003)
- Cross-cutting issues:
- CERT report 'Technologies for Significant GHG Reductions from Energy'
- Renewables in buildings, incl. BCG update

③ IEA 活動の方向性は：
- More research, Development, Demonstration and Deployment (RDD&D) rather than only RD&D

- Easier process for new participants from non-Member countries and private sector
- Increased interaction with the IEA Secretariat on the substance of IAs
- Performance measurement
- Increased visibility of IA achievements at Governing Board level

③ 改定期にある実施協定 IA の方向性は：

1. IEA 事務局と IA との相互関係強化
2. IA の支援の法的・行政的簡素化
3. 理事会への研究・活動結果の年次報告の回復
4. 実施協定への参加の容易化

④ IEA 戦略の目的：

- Improve energy supply security and diversification
- Improve economic and environmental performance of the energy sector, and enhance options for infrastructure modernisation
- Facilitate global efforts to alleviate poverty, and encourage social progress

⑤ 各実施協定：市場開発活動

⑥ REWP の研究開発戦略３カ年計画：

- Strategic Objectives
- Annual work projects:
  - Year 1: Identify and document medium-to-long-term R&D issues and priority issues
  - Year 2: Development of a Road Map for medium-to-long-term R&D on renewable energy technologies
  - Year 3: Recommendations for additional Implementing Agreement activities
- Current Issues:
  - Energy Security
  - Economic Development
  - Environmental Protection
  - Social Benefits

(8) PVPS IA の End-of-Term レポート

① Nowak 氏より、掲題に関し以下の事項が報告された

② 最終ドラフトを数週間前に各 ExCo メンバーに送付し、承認を得ることができた。

③ 本ドラフトを最終版として、REWP に送付し、活動の延長を公式に要請する。

④ Jacquin 氏より、OA 会議にて End-of-Term に対するコメントが整理された旨、報告されたが、この場での議論とはならなかった。

(9) PVPS 実施協定の将来戦略

① Nowak 氏により、掲題に関する説明がなされ、議論がなされた。

② 次回 ExCo までに PVPS の次期戦略を策定したい。

③ End-of-Term レポートに盛り込まれた内容をベースラインとし、発展させていきたい。

④ 主なコメントは以下の通り。

C)Strategy と Workplan は異なる。

Q)CERT Criteria for Implementing Agreement Extensions がガイドラインになるのではないか。

A)一般的すぎるので、もっと具体的にしたい。

C)広範な Top down ではなく、Audience からの Bottom up を取り込むような視点が必要である。

C)Sustainability とは No Subsidised ということになろう。しかし、現在の PV 市場の 90%は助成によるものである。

C)全てのエネルギー技術は助成されており、大きな問題ではない。

C)助成の本来の目的は Driving Force であり、Sustainability を実現するためのものではない。

C)「Sustainable Market」とは何かを明確にすべきである。

C)PV のみに固執するのではなく、エネルギーサービスという観点からの方向付けが必要

である。

C)Stakeholders の特定、およびコミュニケーションの取り方も明確にしていくべきである。

⑤ 議論の後、以下の国々の協力により、ドラフトを完成させることとなった。：オーストラリア、カナダ、米国およびイギリス。E-mail Communication を通じ、11 月末を目処とする。

(10) 2002 年予算に関する事項

① 各国からの Common Fund 支払状況が報告された。
② これまで、米国、日本、イタリア、イスラエル、オーストリア（？）からの支払が確認されていない。
③ 日本は支払い済である旨、木村氏より報告され、再確認を要請した。

(11) OA 会議報告

① Jacquin 氏より OA 会議報告がなされた。
② オランダ、スペインの参加の問題
③ OA と ExCo のコミュニケーション
④ Target audience survey
⑤ EOT report overview
- External point of view
- Internal point of view
⑥ Task management：Meeting 開催頻度：前半は多く、後半は少なく。
⑦ 各タスクの開催予定

	2003-I	2003-II	Note
Task 1	March 5-7, London	Sept. 10-12, Stockholm	
Task 2	19-20 March, Sophia	Sept. 10-12, Berlin	
Task 3	March 24-26 2003, Morges, CH	Sept. 2nd week, Kassel, DE	
Task 8	July 4-5, Paris		May 18, International Symposium, Osaka
Task 9	March 24-26, Vietnam	Sept., West Africa	
Task 10			

⑧ 次回ＯＡ会議の議長：Mr.Dahl (Task II –OA)
⑨ 主なコメントは以下の通り。
⑩ オランダの参加について：予算の目処がたっておらず、現行の Activities への支援はともかく、新たな活動への支援は出来ない（特に Task VIII、Task IX）（オランダ ExCo）。これに対し，PVPS ExCo として支援継続を推奨すべきである、とのコメントあり。
⑪ スペインの参加について：新たな Contract party を見出し、参加復活に向け努力する（Nowak 氏）。

(12) *Task 評価:Task VIII*

① Arbib 氏(イスラエル)より、Task VIII の評価結果について報告された（**別添１**）。
② 既に現行ワークプランの最終段階となっていることから、報告書案に対する要改善事項の抽出、活動継続の提案に対する承認判断の助けとすることを目的として、評価を実施した。
③ もともとは分散型ＰＶがよいと思っていたが，すこし気持ちが変わった。建設的にタスクの延長を支持したい。
③ **Sources/input for the evaluation**：専門家会議に出席することができなかったため、ワークプランや会議議事録、最終報告書案を参照し、イスラエルから参加している専門家や OA とのディスカッションにより、評価を行った。

④ **Objectives**:明確に提示されている。
⑤ **Target Groups**:ターゲットグループが多すぎないか？活動の延長に際しては、もっと絞る必要がある。
⑥ **Products/Deliverables**:明確であり、最終報告書もほぼ完成している。最終報告書において、Part3 はよく論じられているが、今ひとつ焦点が絞れていない。また、Subtask3 の目的を十分には満たしていない。
⑦ **Dissemination**:Publication、Meetings、Internet。Task VIII としての公式 website が作成されているが、ワーキングツールであって、Dissemination には適していない。
⑧ **Participation**:スペイン以外の国は活動に参加している。スイスやスウェーデンは何故、早い段階において参加しなくなったのか？モンゴルのオブザーバ参加は成果である。活動が延長される場合、参加国を増やす必要がある。
⑨ **Management**:**非常に効率的に運営されている。**
⑩ **Remarks and Recommendations**:**以下の通り。**

1. 太陽熱発電システムとの比較もしてほしい。Perform a comparison of PV and Concentrated Solar Thermal (CST) as candidate technologies for central power plants in areas with high direct solar radiation ► cooperate with IEA/SolarPACES.
2. 土地は只ではない。Take land cost into account. Land requirements should be optimized with respect to a specified electricity demand load. Use dedicated software to calculate land-module ratio for different systems.
3. ６砂漠の評価では比較が可能であるが, より詳細なケーススタディになるとケース間の比較が同じ基準でできない。State clearly comparison criteria for three case studies of Part 2 (Gobi, Sahara and Negev) - they are not easy to compare.
4. 長距離送電の送電コストを含めた検討をしてほしい。consider including long-distance high-voltage transmission costs.
5. Most chapters need editing work (both language and style).
6. Review Part 3 so that it looks more as a feasibility study. In particular:
    - Economic analysis should be more focused;
    - RD&D plan appears redundant;
    - A green belt is unnecessary.

⑪ **Conclusions**:

- A lot of good work was performed; at least three new contributions are included that do not appear elsewhere.
- An additional effort is needed to make the products more useful and friendly to potential stakeholders.

⑫ 引き続き、OA(加藤氏)より、コメントが述べられた。

・最終報告書への改善要望の一部は既に対応しているが、時間を要するものは活動延長に際してのワークプランに盛り込んでいきたい。
・このようなタイミングでタスク評価を実施することは適切ではない。タスク活動のスケジュールや進捗を鑑み、評価実施のタイミングを再検討すべきである。
・各国からの Suitable なメンバー参加を確保して欲しい。

(13.1) *Task VIII に関する状況報告*

① 加藤氏より Status Report にもとづき Task VIII（**別添２**）の状況について報告された。
② 黒川から最終報告書の概略および改良された推奨事項が報告された（**別添３**）。
③ ExCo での審議案件は：

・最終報告書の出版原稿
- 最終報告書のドラフトを送付し、Ballot を要請している。本 ExCo 会議にて承認を得たい。

・国際シンポジウムの開催および Agenda
- 2003 年 5 月 18 日に、WCPEC-3 のサイドイベントとして、国際シンポジウムを開催する。前回専門家会議にて、ドラフト Agenda を作成した。
- 全 ExCo メンバーに参加して欲しい。また、全タスクメンバーがシンポジウム参加できるよう、旅費の支援等を参加国の ExCo メンバーにお願いしたい。

・活動延長に向けたワークプラン

- 前回 ExCo 会議の議論を受け、活動延長のワークプランを作成した。
- 本 ExCo 会議にて承認を得たい。また、新たな参加国を募りたい。

④ **討論の概略:最終報告書の出版原稿について**

Q)PVPS ロゴの扱いなどについて、確認・検討が必要ではないか？（Claverie 氏）

A)レイアウト等の Editing は最終的に James & James 社が行うことになるが、その段階で確認すれば良い。（Nowak 氏）

Q)事前に送付されていた原稿と、今回配布された資料とは内容が異なるのか？（Arbib 氏）

A)Recommendations の改訂を行ったが、他の部分はほとんど同じである。（黒川教授）

Q)国名の入ったアフリカの地図を用い、VLS-PV の設置イメージを提示するのは不適切ではないか？（Claverie 氏）

A)ケーススタディの中で例示されているだけである。Recommendations として記されているわけではないので、問題はない。（Arbib 氏）

C)EU やイタリアの地中海 Initiative と合い通じるところがある。また、リビアの Electric Company が VLS-PV に興味を示していた。（McNelis 氏）

⑤ 議論の後、最終報告書出版原稿が承認された。

⑥ James & James 社による編集が終了した原稿(または Proof)が今回承認した原稿と内容に相違がないか最終チェックをして，Nowak 氏、Schaap 氏に（手順として）最終承認してもらうことが要請された。

⑦ **討論の概略：国際シンポジウムについて**

C)World Bank、GEF に対する Invitation は、注意が必要である。

⑧ **活動延長・ワークプランについて**

a) 参加国 ExCo からのコメント

- イスラエル：タスク評価で言及した Recommendations を反映して欲しい。また、Target を明確にする必要がある。(Arbib 氏)。
- イタリア：Menna 氏が EC にいってしまったが、代わりのメンバーを ENEA からアサインする。（Castello 氏）
- オランダ：Verhoef 氏から提案（継続参加への支援要請）があったが、NOVEM として第二フェーズへの参加に対する支援は行わない。ただし、国内の専門家が他の fund 等で参加することに支障はない。Verhoef 氏は別の fund により継続参加する意思を示している。（Swens 氏）
- アメリカ：支援する。（Hassett 氏）
- 韓国の ExCo は今回欠席しているが、継続を強く支援している。

b) その他のコメント等

Q)オーストラリアに参加してもらうことは可能か？（加藤氏）

A)参加するつもりはない。（Schaap 氏）

C)Utility からのメンバーをうまく巻き込む必要がある。

⑨ 議論の後、活動の延長が基本的に承認された。

⑩ タスク評価の結果等を踏まえた改訂ワークプランを作成し、次回 ExCo にて再度提案するよう要請された。

⑪ アルジェリアやリビアが加入したがっているという話もあった。

(14) Task VII に関する事項（Remaining Issues）

① Nowak 氏より、ローマ（PV in Europe）にて最終ワークショップが開催された旨が報告され、「Concluded」として承認された。

(15) Task V に関する事項（Remaining Issues）

① Nowak 氏より、End-of-Term レポートおよび前回 ExCo 会議時点で未完成であったテクニカルレポートの最終版が提出されていない旨、指摘がなされた。

② 日本メンバーが、帰国後、速やかに確認するよう、要請がなされた。

(13.2) Task IX に関する状況報告

① McNelis 氏より Task IX の状況報告がなされた。

② ExCo での審議案件は：

・進捗状況

- スケジュール通り進んでおり、大きな問題はない。

・メンバー参加の状況

- オランダとイタリアの出席が悪い。
- スウェーデンが新規に参加した。

・活動の延長

- Subtask 40: PV systems for community and village applications
- Subtask 50: PV grid support
- Subtask 60: PV and water provision

③ 活動延長に対する主なコメント：

C)活動の延長は支持するが、日本が継続して参加するか否かを判断するためには、Task III との区別を明確にして欲しい。（NEDO）

Q)Subtask50 は、現在休止中の Task IV と重複するのではないか？（黒川教授）

A)コンセプトが異なる。（McNelis 氏）

C)Subtask40 と 60 のオリジナリティが不明瞭である。

C)現在のフェーズの Results がもう少し明確になってから、具体的にコメントしたい。次回 ExCo にて再度提示して欲しい。（Nowak 氏）

(16) Task III に関する状況報告

① Jacquin 氏より Task III の状況報告がなされた。

② ExCo での審議案件は：

・活動スケジュール：公式な活動終了期日は 2003 年 10 月か、2004 年 5 月か？

・Publication の承認：2002 年 12 月 15 日までの Vote を依頼→承認

(17) Task II に関する状況報告

① Dahl 氏より Task II の状況報告がなされた。

② ExCo での審議案件は：

・オランダの参加の問題

・データベースの dissemination

・タスクメンバーが、WCPEC-3 に投稿・参加することに対する支援

(18) Task I に関する状況報告および審議

(18.1) Task I に関する状況報告

① Watt 氏より Task I の状況報告がなされた。

② ExCo での審議案件は：

[Matters for ExCo]

・ISR 作成を外部委託ではなく、タスクメンバー内での実施に切り替え（Common fund を利用）

・PV industry chain の検討（ExCo メンバーの参加）

・NSR の原稿提出の要請（未提出国に対して）

(18.2) Communication matters

① Watt 氏より報告がなされた。

② 活動成果に対する Interest の Priority

High Priority	
Handled by PVPS	Handled nationally
・Market status & trend	・Economics of PV
・Added value	・Grid-connected issues
・National program & policies	・Marketing & promotion
・Building integration	・Industry guidelines & standard

Middle Priority	Little Priority
・Profiles of companies, people ・R&D ・New commercial products ・Prospects & case studies ・Utility applications ・Education & training	・Off-grid ・Large-scale PV ・Hybrid system

(19) Task X: ワークプランに関する討議

① Schaap 氏より、Task X のワークプラン案が報告された。（報告された内容は、初日(10/14)に開催されたワークショップで披露された内容を基本とし、ローマ（PV in Europe）で開催されたワークショップで得られたコメントを踏まえ、改訂されたものである。）

② プレゼンの項目は以下の通り。

・ Vision
・ Objectives
・ Building on Past and Current Tasks
・ Guiding Principles
・ Strategies
・ Concept and Process
・ Key Stakeholders in Large Scale Urban PV Application
・ Interest Area
1: Planning, Design & Development (Planning, Architecture and Building Sector Needs)
2: Technical Factors (Engineering, Interconnection, Utility Issues)
3: Economics & Institutional Factors (Finance/Client, Insurance & Policy Issues)
4: Targeted Information Development & Dissemination (Appropriate media - FAQs, videos, databases of grants, loans etc, case study & lessons learned reports; Demo site developments; Workshops, charettes; Feedback loops to manufacturers)
5: Whole-of-Building PV R&D Activities (Whole-of-building design needs, incorporating PV electricity production and use (energy service)) ←追加された Interest Area
・ Next Steps
・ ローマ（PV in Europe）で開催されたワークショップで得られた主なコメントは以下の通り。
- Need for lots of clever thinking
- Need to add stakeholders –research institution and education institutions
- Need for official letter to obtain government commitment
- Need to review the future benefits for targeted participants

③ 主な討論内容は：
C)ビル建物に限定せず、住宅も範疇に加えてはどうか。
C)対象とする範囲が広すぎ、焦点が定まらない。

④ 議論の後、以下の国々の協力により、ワークプラン案を完成させることとなった。：オーストラリア、カナダ、米国、スウェーデン、オーストリアおよびイギリス。E-mail Communication を通じ、11/15 を目処とする。

⑤ また、ワークプラン案を踏まえ Task Definition Workshop を来年初頭に開催することとなった。

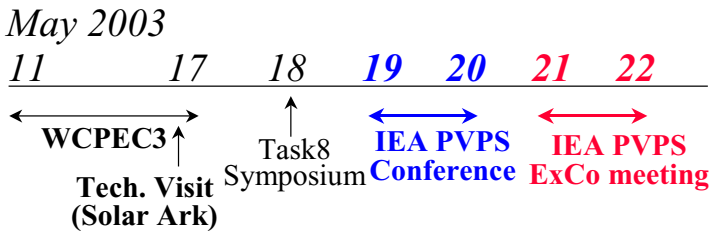
(20) PVPS Conference(at Osaka)に関する討議

① Nowak 氏より Conference の主旨が説明された。
・ これまで議論されていた Executive Conference について、新たな解決策を検討した。
・ PVPS の１０周年を記念し、PVPS の過去、現在、未来を議論する。

・時期は当初通り 2003 年 5 月に大阪で開催する。

② 引き続き、加藤氏より PVPS Conference の concept paper 案について報告され、議論がなされた。

・開催期間：2003 年 5 月 19-20 日 (at 大阪)。

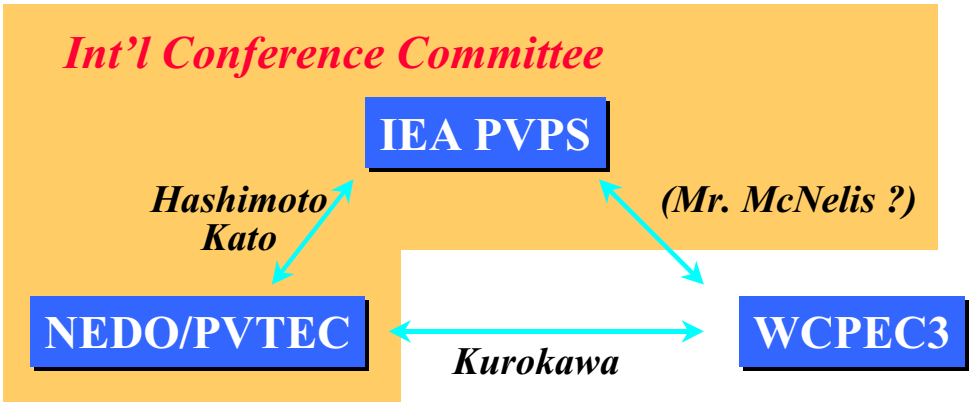


・会議形態：初日はオープンセッション、2 日目（半日）はセミクローズセッション、参加費徴収。

・実施体制：

Hosted by... NEDO under the responsibility of IEA PVPS
Supported by... IEA, METI, EU, DOE, JPEA, EPIA, SEIA。
International Conference Committee。
- Chair: Nowak 氏
- Vice-chair: Schaap 氏、橋本室長
- Members: IEA、ExCo メンバー代表、加藤氏、Task I-OA、JPEA、EPIA、SEIA
- Secretariat: NEDO、PVTEC

日本国内の組織委員会も早急に発足する予定。
同時期に開催される WCPEC-3 との効果的な連携も必要(下記体制)。



③ 説明の後、議論が行われた。

Q)WCPEC-3 とパラレルの 1-day ワークショップにしてはどうか。そうすれば、Conference 参加者は WCPEC-3 の Exhibition も見ることが出来る(Claverie 氏)。
A)WCPEC-3 はテクニカルな Conference であり、性格が異なる。サイドイベントには相応しくない（Nowak 氏)。
C)前日（18 日）に見ることが出来る。また、Task-8 のシンポジウムも 18 日に開催する。
C)提示の案をサポートする。(Schaap 氏)。
Q)Audience はどのように考えているのか（Arbib 氏)。
A)あまり限定せず、広く設定している（Nowak 氏)。
C)Invitation の送付をある程度限定すればよいのではないか（Dignard-Bailey 氏)。
C)提示の案をサポートする。(Hassett 氏)。
C)若干ではあるが、PVPS の Common Fund からも拠出できる。
C)WCPEC-3 の Exhibition に、PVPS として出展してはどうか（Claverie 氏)。

④ 議論の後、今回提示の基本枠組みを承認された。

⑤ 個々の詳細な事項は Conference Committee にて検討されることとなった。

(21) IEA/SHCP との協力について

① 関連するイベントとして、ISES 2003（at Sweden）の Invitation が Malmkvist 氏より配布された。

(22) 今後の ExCo 会議スケジュール

① 次回(第 21 回)ExCo 日程および開催地：
[日程]
2003 年 5 月 21 日(水)-5 月 22 日(木)
[開催地]
日本：大阪にて（in conjunction with PVPS Conference）

② 次々会(第 22 回)：
[日程]
2003 年 10 月 20 日(月)-10 月 22 日(水)
[開催地]
ドイツ：ベルリン、またはユーリッヒにて

(23) その他の事項

① Hassett 氏より DOE で企画したソーラー十種競技 Solar Decathlon：Challenging students to build the future に関するプレゼンがあった。www.solardecathlon.org にて出典作品等の閲覧が可能。

② Pietruszko 氏よりポーランドにおける太陽光発電にかするプレゼン。

(24) 閉会

① Nowak 氏より開会の挨拶がなされた。

9. IEA PVPS Conference アンチーブ会合

9.1 **日時：**10 月 17 日 9 時～11 時

9.2 **場所：アンチーブ・ロイヤルホテル**

9.3 **出席者**

ノワーク氏，ハセット氏，マックネリス氏，橋本氏，加藤氏，原田氏，河本氏，黒川

9.4 **議事概要**

（１） ExCo 会議議題(20)の決定に基づき, 大阪で来年五月に開催される IEA PVPS Conference の細目について ExCo 翌日にアンチーブにおいて会合を持ち，NEDO 作成のコンセプトペーパーについて逐条的に点検討論した。

（２） 本会合の議論点については，**別添４**に黒川作成の英文メモを添付する。

（３） 次回は，1 月 17 日（金）にパリで開催されることに仮決定した。

別添１

Internal Evaluation of IEA-PVPS Task 8
Very Large-Scale PV Power Generation Systems
(1999-2002)

Performed by Avraham Arbib,
Ministry of National Infrastructures, Israel

October 2002

Sources/input for the evaluation
The evaluation was based on:

- Workplan
- Draft final report
- Minutes of meetings
- Other deliverables (such as website)
- Communications with OA and Israeli expert

Unfortunately, the evaluator could not attend any expert meeting. In addition, the evaluation was carried out after the draft final report was issued. Therefore, this evaluation is aimed more at giving recommendations for improvements to the final report, and to help decision toward Task extension.

Objectives
Workplan: drafted – October 1998, modified – June 1999

Objectives were clearly formulated and reasonably measurable.

Three Subtasks:

1. Conceptual Study of the VLS-PV System
2. Case Studies for Selected Regions for Installation of VLS-PV Systems
3. Comprehensive Evaluation of the Feasibility of VLS-PV

Target Groups
Not clearly defined in the Workplan.
Mentioned in the recommendations – too many.
Target groups apparently were not involved in the activities definition, at least not in the initial stages.

Products/Deliverables
Clearly defined.
Draft Report “A desert produces energy” – completed.
Part 3 is very thorough, but not very focused. Does not match fully the objectives of Subtask 3. Needs improvement.

Dissemination
Publications
1) “A Preliminary Analysis of Very Large Scale Photovoltaic Power Generation Systems”, Report IEA-PVPS VI-5 1999:1 (May 1999) [Internal report]
2) “A Desert Produces Energy” [Task 8 official brochure]
3) “A Desert Produces Energy” (to be published in May 2003 from James & James) [external report]

Meetings

- International Workshop (May 2000, Glasgow)
- International Symposium (June 2001, Cheju Island)

(Unfortunately there is no summary document, but over 50 persons attended this symposium)

- Poster presentations at many international conferences (EUPSEC, IEEE PVSC, PVSEC, WREC, etc.)
- The final International Symposium (to be held in May 2003, Osaka as a side event of WCPEC-3)

Internet

Establishment of official task website: *http://staff.aist.go.jp/kazuhiko.kato/VLSPV/*
In my opinion, good as working tool, but not for dissemination.

Acceptance of products - so far, untracked and unclear.

Participation

Participating countries: Israel, Italy, Japan (OA), Korea, the Netherlands, Spain, Sweden, Switzerland, USA.

Participation of Task participants was satisfactory (except Spain). Also, it is not clear why Sweden and Switzerland ceased to be members at an early stage. Mongolia was accepted as an observer.

If Task is extended, it would be desirable to involve additional countries (e.g. Australia).

A PV manufacturer was involved in the work, as well as utilities.

Management

Good and effective.

Remarks and Recommendations

7. Perform a comparison of PV and Concentrated Solar Thermal (CST) as candidate technologies for central powerplants in areas with high direct solar radiation ► cooperate with IEA/SolarPACES.
8. Take land cost into account. Land requirements should be optimized with respect to a specified electricity demand load. Use dedicated software to calculate land-module ratio for different systems.
9. State clearly comparison criteria for three case studies of Part 2 (Gobi, Sahara and Negev) - they are not easy to compare.
10. consider including long-distance high-voltage transmission costs.
11. Most chapters need editing work (both language and style).
12. Review Part 3 so that it looks more as a feasibility study. In particular:
    - Economic analysis should be more focused;
    - RD&D plan appears redundant;
    - A green belt is unnecessary.

Conclusions

- A lot of good work was performed; at least three new contributions are included that do not appear elsewhere.
- An additional effort is needed to make the products more useful and friendly to potential stakeholders.

別添２

IEA Implementing Agreement on Photovoltaic Power Systems

Task VIII Status Report

October 2002

OA's
K. Kato, (NEDO) Japan
K. Kurokawa, (TUAT) Japan

Task VIII:
Study on Very Large Scale Photovoltaic Power generation System (VLS-PV)

Objective

The objective of this Task is to examine and evaluate the potential of Very Large Scale Photovoltaic Power Generation (VLS-PV) Systems, which have a capacity ranging from over multi megawatt to GW, by identifying the key factors that enable VLS-PV system feasibility and clarifying the benefits of this system's application to neighboring regions, as well as the potential contribution of system application to protection of the global environment and renewable energy utilization in the long term also will be clarified. Mid- and long-term scenario options for making VLS-PV systems feasible in some given areas will be proposed.

Participating Countries

Israel
Italy
Japan
Korea
The Netherlands
Spain
United States
Mongolia (observer)

Key matters for ExCo discussion and/or action

(1) Publication of the final report

Based on the approval by task participants and comments from ExCo members who are participating in task 8 as well as Task 1 OA, the final draft of Task 8 report entitled 'A DESERT PRODUCES ENERGY' has been completed. Copies of this draft were sent to all the ExCo members with report approval ballot and order form (as shown in *attachement #1*)

at the beginning of September 2002. The report may be published from James and James at the end of 2003.

ExCo is asked to approve the publication of the report.

(2) Preliminary agenda of international symposium

As reported previously, we have a plan to hold the international symposium on VLS-PV at Osaka on May 18, 2003 as a side event of WCPEC-3. This is the last activity of Task 8 based on the current Work Plan. A preliminary agenda was made at last task participant meeting as shown in *attachment #2*.

All the ExCo members are very much welcome to take part in this symposium, and the ExCo members participating in Task 8 are asked to encourage task participants to attend this symposium.

(3) Extended Work Plan

According to the ExCo suggestion at last ExCo meeting, extension of Task 8 was discussed at last participant meeting held in September 2002 at Warsaw, Poland. Attachment #3 is a draft of extended work plan.

ExCo is asked to approve this work plan, and participation of new countries are very much welcome.

Brief Summary of Task Activity during the Last 6 Months

1. The 8th (and the last) participant meeting

The 8th participant meeting was held on September 12 - 14 at Warsaw in Poland, invited by Dr. Stanislaw M. Pietruszko, Warsaw University of Technology.

In conjunction with this meeting, Symposium on PV technology was organised by Dr. Pietruszko and the OAs.

(1) Publication of the final report

The progresses in the reviewing process were reviewed. The most of manuscripts have been already reviewed and compiled for the publication mainly by the efforts of Mr. Verhoef, Mr. Komoto and Mr. Kato. The native check has also been made for the existing manuscripts by the settlement prepared by Mr. Urabe, PVTEC. The present version of the manuscript was also sent to all the ExCo members for the publication approval vote ballot. Total pages will be around 35 pages. The structure of the cover pages were discussed and restructured as follows:

1st Cover: without name
2nd Cover: with the name of Editor, Prof. Kuokawa
Preface: by ExCo Chairperson, Mr. Nowak
Foreword: by OAs, Prof. Kurokawa and Mr. Kato with the list of task participants
Table of Contents
Main body
List of Contributors: with the indication of contributed parts

Acknowledgements: the name of experts and organisations with their role
Back cover

The contents of the short summary as the comprehensive summary was presented by Mr. Verhoef and reviewed by all the participants. It was agreed that the proposed draft was appropriate mostly.

The recommendation part was presented by Prof. Kurokawa and Mr. Verhoef. It was agreed that the latter by Mr. Verhoef would be included as a condensed recommendations. It was reviewed by all the participants.

Publication business issues were discussed very carefully in terms of printing plan, royalty, price, etc. It was pointed out that some unidentified parts in the minutes for J&J had to be clarified and informed by Mr. Urabe immediately.

(2) Discussion on the international symposium

International Symposium will be held in Osaka, May 2003 as the last course of Task 8 Phase I. Tentative programme was suggested as follows. Revision will be prepared by Mr. Kato and sent to the experts by the end of September and finalised for discussions at next ExCo meeting.

1. Short Introductory session including preliminary study - 20 m.
2. Case Studies from each contributors - 20 m. each for 3 presentations
3. Discussion for questions - 30 m.

<30 m. break>

4. Scenario Studies and Recommendations - 20 m. each for 2 presentations
5. Panel for taking stakeholders' opinions and for the extended work plan of Task 8
6. The following specialists will be invited: GEF, WB and Mongolian specialist or possibly desert country specialists, utility (e.g: NUON, SMUD)

(3) Extension of Task 8

Mr.Kato reported ExCo suggestion at last ExCo meeting and proposed new work plan for second phase of Task 8.

As a result of discussion, the following revisions were decided:

- New objective until 2005 has to be more clearly specified to show difference from the first phase.
- Expected outcome will include project action plans of the 4th category including financing, specific local conditions for plural locations, template for making action plans, newly available operating technical/economical information from desert regions.

Procedure to settle Task 8 proposal to ExCo decided to make e-mail communications to have final version by 4 October.

2. Publication of the final report

Technical review of the draft manuscript by task participants was finished at the end of June. While native check of the manuscript was started as well. At the end of July, copies of the manuscript were sent to ExCo members of participating countries and Task 1 OA for review.

Based on the approval by task participants and comments from the ExCo members, the final draft has been completed. Copies of this draft were sent to all the ExCo members with report approval ballot and order form (as shown in attachement #1) at the beginning of September 2002.

On the other hand, we have been negotiating with James and James for publication of the report, and we plan to make a contract at the end of this October.

Progress with Task Activities

1. Accomplishments of the previous six months

During the previous six months, Task 8 concentrated our activities on publication of the final report and arrangement for the international symposium, both of which are described in the previous parts.

2. Plans for the next six months

(1) Publication of the final report
The final report will be printed by the end of March 2003.
(2) Planning the International symposium
The international symposium will be planned by email communication among the task participants.

3. Summary of documents published and planned

- 'A preliminary Analysis of Very Large Scale Photovoltaic Power Generation (VLS-PV) Systems' (1999 internal report under the umbrella of IEA/PVPS Task VI) – published
- Proceedings of international symposium 2001 (external and public web-site) – published
- Final edition of Task report (external) - planned by the end of March 2003.

Summary of Task participation and effectiveness

Member			Meeting (in total)										
			Task VI Subtask 50			Task VIII							
			1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th
			1998			1999		2000		2001		2002	
(CH)	(Mr. R. Minder)	(Minder Energy Consultant)	A	A	n	n	n	-	-	-	-	-	-
IL	Mr. D. Faiman	Ben-Gurion Univ.	-	-	-	n	A	A	A	A	n	A	A
IT	Mr. P. Menna	ENEA	A	A	n	A	A	A	n	A	n	N	N
	Mr. F. Paletta	CESI SFR-ERI	A	A	n	A	A	A	A	n	n	N	N
JP	(Mr. M. Kando)	NEDO	-	-	-	-	A	A	A	n	-	-	-
	(Mr.K.Konno)		A	A	A	n	-	-	-	-	-	-	-
	Mr. K. Kato		A	n	A	A	A	A	A	A	A	A	A
	Mr. K. Kurokawa	TUAT	A	A	A	A	A	A	A	A	A	A	A
	Mr. K. Otani	AIST	-		-	-	-	A	A	A	A	A	A
	Mr. K. Komoto	Fuji Research Institute (FRIC)	-	-	A	A	A	A	A	A	A	A	A
KR	Mr. J. Song	KIER	n	n	A	n	A	A	A	A	A	N	A
NL	(Mr. W. Rijssenbeek)	ETC Energy	A	A	A	n	A	A	-	-	-	-	-
	(Mr. J.v.d. Linden)		-	-	-	A	A	A	-	-	-	-	-
	(Mr. P. Kieskamp)		-	-	-	A	n	n	-	-	-	-	-
	Mr. L. A. Verhoef	Verhoef Solar Energy Europe	-	-	-	-	-	-	A	A	A	A	A
	Mr. P.v.d. Vleuten	Free Energy Europe	A	A	A	n	A	A	A	A	A	n	A
ES	Mr. J.G. Martin	IBERDROLA	A	A	n	n	n	n	n	n	n	n	n
	Mr. A.d.J. Palero		A	A	A	a	n	n	A	n	n	n	n
	Mr. L. A. Calvo		-	-	-	-	A	n	n	n	n	n	n
SW	(Mr. G. Anderson)	Royal Institute of Technology	n	A	A	n	A	-	-	-	-	-	-
US	Mr. D. Collier	SMUD	-	-	-	n	n	n	A	A	n	n	n
MN	Mr.N.Enebish	Ministry of Infrastructure	-		-	-	-	-	A	A	A	n	A

Note: ‘A’: attendance, ‘n’: absence, ‘-‘: not member

Next meetings

Past Meetings

As "Task VI / Subtask50"

1st: 22-23 January, 1998, Madrid, Spain
2nd: 29-30 September, 1998, Milan, Italy
3rd: 7-9 December, 1998, Kyoto, Japan

As Task VIII

1st (4th): 29-30 June, 1999, Paris, France (hosted by NEDO)
2nd (5th): 1-3 December, 1999, Utrecht, the Netherlands (hosted by NOVEM)
3rd (6th): 30 April, 2000, Glasgow, the United Kingdom (hosted by NEDO)
4th (7th): 15-16 and 18 September, 2000, Sacramento, the United States (hosted by DOE)
5th (8th): 9-10 June, 2001, Cheju Island, Korea (hosted by KIER)
6th (9th): 2-4 September, 2001, Ulaanbaatar, Mongolia (hosted by NEDO)
7th (10th): 28 February -1 March, 2002, Utrecht, the Netherlands (hosted by NEDO)
8th (11th): 12-14 September, 2002, Warsaw, Poland (hosted by NEDO)

Future Meetings

9th (12th): 4-5 July, 2003, Paris, France

Workshops/Symposiums

Past

International Workshop: 2 May, 2000, Glasgow, the United Kingdom
International Symposium: 11 June, 2001, Cheju Island, Korea

Future

International Symposium: 18 May 2003, Osaka, Japan (as a side event of WCPEC-3)

Attachment #1: Approval of Report (Email sent on September 9, 2002)

To PVPS ExCo Members participating Task 8,
CC: other ExCo members and ExCo secretary

At the last weekend, the final draft report entitled 'A DESERT PRODUCES ENERGY', which is the overall results of Task 8 activity, has sent by postal mail to ExCo members of Task 8 particiapting countries for your approval for publication and to other ExCo members for your reference.

As you know, this report will be published from James and James as a book, and has been previously approved for publication by the Task participants.

This will be on your hand soon, but we cerelessly forgot to include a letter head (I am sorry).
A report ballot and order form is attached to this eMail.

According to IEA/PVPS publication procedure, I would like to ask ExCo members of Task 8 participating countries, that is, Israel, Italy, Korea, Japan, the Netherlands, Spain and the United States, to respond to ExCo secretary with this form during next ExCo meeting at the latest.

In addition, I would like to ask other ExCo members who want to have additional copies of the report with prepurchase cost memtioned below to order by using the attached order form.

I am looking forward to seeing you again in France (and your approval).

Sincerely yours,

Kazuhiko Kato
PVPS Task8 OA,
NEDO, Japan

Distribution Plan

1. Expected Publication Date: 31 March 2003
2. A total of about 200 copies will be provided for free distribution by the Operating Agents:
   - ExCo members: 2 copies
   - IEA secretariat: 2 copies
   - Executive Secretariat: 2 copies
   - Task Participants: 20 copies each
3. An additional quantity will be printed to fill the orders of the ExCo member countries, which are submitted with the ballot. These reports will be available:
   [x] approximetely at the cost of 50-60 UDS per report (33% discount for cover price) (Now under negotiation with James and James)
   [ ] at no cost, with a maximum of <Number of copies> copies per country.

4. After distribution, additional copies of the report will be available from:
   Mrs. Akemi Ichijo, A&I Limited
   OSAWA Bldg., 2-15-4 NIHONBASHIKAYABA-CHO, CHUO-KU, TOKYO 103-0025, JAPAN
   Telephone: +81-3-5623-6255 ; Telefax: +81-3-5623-6256 ; Email: aandi@fancy.ocn.ne.jp

5. Task Participants have recommended the following distribution classification:
   [ ] Restricted: IEA member countries only (including those not participating in this Task)
   [x] Unrestricted

6. Vote on this report will be conducted:
   [ ] By post mail
   [x] By email
   [x] At the next ExCo meeting.

Report Approval Ballot and Order Form

To: Executive Committee Secretary PVPS Programme

Re: Task 8 report entitled: A DESERT PRODUCES ENERGY
submitted with cover letter of 9 September 2002

[ ] I approve
[ ] I approve subject to incorporation of the attached modifications
[ ] I disapprove; comments attached

Order request

I wish to order ..... additional copies. These copies should be sent to:

.....

.....

.....

Executive Committee Member

Name: .....

Country: .....

Signature: .....

Return to the ExCo Secretary by: 15 October 2002.

Attachment #2

'A DESERT PRODUCES ENERGY'

An International Symposium on Very Large-Scale Photovoltaic Power Generation (VLS-PV) System
IEA PVPS/Task 8

Date: 18 May, 2003
Venue: 'Grand Cube Osaka' (Osaka Int'l Convention Center)

Tentative Agenda

(Draft as of 01 October 2002)

Opening Session **Chairman: Mr. Vlueten**

13:00-13:10 Opening — Mr. Kato
- *Welcome speech, Brief history and outline of Task 8*

13:10-13:30 Introduction of VLS-PV concept — Mr. Kurokawa
- *World energy issues and concept of VLS-PV (including the results of preliminary case study)*

Technical Session: VLS-PV Case Studies **Chairman: Mr. Song**

13:30-13:50 Case study on the Gobi Desert from a life-cycle viewpoint — Mr. Kato
- *Cost, energy pay-back time and CO2 emission of VLS-PV*

13:50-14:10 Case study on the Sahara Desert — Mr. Menna
- *Network concept and technology transfer*

14:10-14:30 Case study for the Middle-East — Mr. Faiman
- *Sun-tracking non-concentrator and concentrator photovoltaics*

14:30-15:00 *Discussion*

15:00 - 15:30 Break

Round Session: Scenario Studies and Recommendations **Chairman: Mr. Menna**

15:30-15:45 Sustainable growth of VLS-PV system concept — Mr. Komoto
- *Concept of sustainable growth and approaches for VLS-PV*

15:45-16:05 Recommendation — Mr. Kurokawa
- *General understandings and recommendation of VLS-PV*

16:05-16:15 Next activities for VLS-PV — Mr. Kato
- *Extended work-plan of Task VIII*

16:15-17:45 Panel: Financial and organizational sustainability — Mr. Verhoef *(moderator)*
- *Presentation on 'Financial scenario and approaches for VLS-PV, including the market trends relevant to VLS-PV'*
- *Discussion for taking stakeholders' opinion*
  - *utility: Mr. Collier (SMUD, US)*
  - *desert country: Mr. Enebish (MOI, MN)*
  - *invited: GEF, WB and other desert country specialists, utility (e.g: NUON)*

17:45-18:00 Summary of symposium — Mr. Kurokawa

18:00 Closing — Mr. Kato

Attachment #3

Revision of Work Plan of Task 8 – Phase II
(Draft as of October 6, 2002)

1. Overall objectives

The objective of this Task is to examine and evaluate the potential of and develop project proposals for Very Large Scale Photovoltaic Power Generation (VLS-PV) Systems, which have a capacity ranging from over multi Megawatt to Gigawatt.

For this purpose, in Phase I, the key factors that enable VLS-PV system feasibility are identified and the benefits of this system's application for neighbouring regions are clarified as well as the potential contribution of system application to global environment protection and renewable energy utilization in the long term is clarified. Mid- and long-term scenario options for making VLS-PV systems feasible in some given areas will be also proposed.

In Phase II, based on the mid- and long-term scenario options of Phase I, practical proposals of PV system projects suitable for selected regions, which enable sustainable growth of VLS-PV Systems in the order of 100 MWp in the near future and general instruction to propose practical projects for realizing VLS-PV system in the future will be developed.

2. Means

Work in pursuit of the forgoing objectives will be performed by electrical engineers, structural engineers, environment assessment experts, photovoltaic industry specialists and related experts from several other fields in Participants' counties. Participants will carry out three Subtasks in Phase I and two Subtasks in Phase II, the objectives of which are as follows:

a) Subtask VIII/1 Conceptual Study of the VLS-PV System

Participants will conduct development of the conceptual configuration of VLS-PV systems by extracting the dominant parameters of the conditions in which the systems are technically and economically feasible from a life-cycle viewpoint. The criteria for selecting regions suitable for case studies of the installation of VLS-PV will be identified and then the regions for case studies will be nominated.

b) Subtask VIII/2 Case Studies for Selected Regions for Installation of VLS-PV Systems

Employing the concepts of VLS-PV and the criteria and other results produced under Subtask VIII/1, Participants will undertake case studies on VLS-PV systems for the selected regions and evaluate the effects, benefits and environmental impact.

c) Subtask VIII/3 Comprehensive Evaluation of the Feasibility of VLS-PV

Participants will undertake joint assessment of the results of the case studies performed under Subtask VIII/2, summarizing similarities and differences in the impact of VLS-PV system installation in different areas, and propose mid- and long-term scenario options which will enable the feasibility of VLS-PV.

d) Subtask VIII/4 Practical Project Proposals for Initial Stage of VLS-PV Systems foe Some Desert Areas

Taking into account of the mid- and long-term scenario studies proposed in the Subtask VIII/3 and the guidelines of subtask VIII/5 described below, Participants will develop practical project proposals for initial stage of VLS-PV systems, which will enable sustainable growth of VLS-PV systems toward the future, for some desert areas.

e) Subtask VIII/5 General Instruction for Practical Project Proposals to Realise VLS-PV Systems in the Future

By extracting essential knowledge from the Subtask VIII/4, detailed practical instructions and training kit for the development of other practical project proposals, to enable others to sustainable implement VLS-PV

systems in the future.

3. Participating Counties (up to present)

- Israel
- Italy
- Japan (Operating Agent)
- Korea
- Mongolia (Observer)
- The Netherlands
- Spain
- The United States
- ? (New countries expected)

4. Detailed Work Plan

Subtask VIII/1 Conceptual Study of the VLS-PV System

Objectives

Participants will conduct development of the conceptual configuration of VLS-PV systems by extracting the dominant parameters of the conditions in which the systems are technically and economically feasible from a life-cycle viewpoint. The criteria for selecting regions suitable for case studies of the installation of VLS-PV will be identified and then the regions for case studies will be nominated.

Activities

1.1 Development of total system concept

Incorporating state-of -the-art PV fabrication technology and the future prospects of that technology, conceptual configuration of VLS-PV systems will be established through extraction of the dominant parameters of production and transportation of system component, construction and operation of VLS-PV system, electricity transmission and related key issues. Potential benefits of VLS-PV system as an energy source and for neighbour region will be also clarified.

1.2 Selection of regions for case study

Criteria for selecting regions for case studies will be compiled. The criteria will involve non-technological and site-dependent parameters such as irradiation condition, climate condition, quality of land surface, flora/fauna, and other environmental issues. Regions for case study will be selected based on the criteria.

Subtask leader

The Netherlands

Results

- A conceptual configuration of VLS-PV system will be established.
- Criteria for selecting of regions for case studies will be clarified.
- Regions for case studies will be selected and working teams for the case studies will be formed.
- Final document: IEA book.

Participation

All participating countries

Subtask VIII/2 Case Studies for Selected Regions for Installation of VLS-PV Systems

Objectives

Employing the concepts of VLS-PV and the criteria and other results produced under Subtask VIII/1, Participants will undertake case studies on VLS-PV systems for the selected regions and evaluate the effects,

benefits and environmental impact.

Activities

Some activities will carry out the following work for the regions selected under the Subtask VIII/1 in parallel.

2.1 Case studies on a region for installation of VLS-PV system

The capacity of VLS-PV system and configuration of each component will be assessed, considering future phase-in of modular subunits. The assessment will take into account the site condition, regional electricity demand, system performance, transmission technology or other alternative options and concurrent use with other energy resources. The possibility of multipurpose use of electricity generated by the VLS-PV systems to improve the nature and socio-economic environment in the region may be investigated. Furthermore, the socio-economic and environmental impacts of installation of VLS-PV systems will be evaluated from a life-cycle point of view.

Subtask leader

Italy

Results

- Effect of VLS-PV system will be clarified.
- Final document: IEA book.

Participation

All participating countries. Members will be divided into some working teams for case studies.

Subtask VIII/3 Comprehensive Evaluation of Feasibility of VLS-PV

Objectives

Participants will undertake joint assessment of the results of the case studies performed under Subtask VIII/2, summarizing similarities and differences in the impact of VLS-PV system installation in different areas, and propose mid- and long-term scenario options which will enable the feasibility of VLS-PV.

Activities

3.1 Comprehensive evaluation for the case studies

Results of case studies will be integrated to develop modified comprehensive models of VLS-PV systems.

3.2 Drafting of scenario options

By putting results of all the activities into this activity, a mid- to long-term scenario options, which make VLS-PV system feasible in the future, will be proposed. Institutional, organisational and financial issues may also be taken into consideration.

3.3 International workshop at the end of Task

At the end of Task VIII, international workshops will be organised. The workshops will mark the conclusion of Task VIII.

Subtask leader

Japan

Results

- Mid- to long-term scenario options to make VLS-PV feasible will be proposed.
- International workshops will be organised.
- Final document: IEA book.

Participation

All participating countries

Subtask VIII/4 Practical Project Proposals for Initial Stage of VLS-PV Systems foe Some Desert Areas

Objectives

Participants will develop practical project proposals for initial stage of VLS-PV systems, which will enable sustainable growth of VLS-PV systems toward the future, for some desert areas.

Activities

Some activities will carry out the following work for the regions in parallel.

4.1 Development of practical project proposals for realising VLS-PV systems

Taking into account of the mid- and long-term scenario studies proposed in the Subtask VIII/3 and the guidelines of Subtask VIII/5 described below, Participants will develop practical project proposals for initial stage of VLS-PV systems, which will enable sustainable growth of VLS-PV systems toward the future, for some desert areas. The project proposals will include system configuration, standardisation, data monitoring, budget making, training of engineers, and possible financial scenarios for sustainable growth of VLS-PV systems. Furthermore, local, regional and global environmental and socio-economic effects given by the proposed project will be also examined.

Subtask leader

Japan

Results

- Practical proposals of PV system project for specific regions.

Participation

All participating countries

Subtask VIII/5 General Instruction for Practical Project Proposals to Realise VLS-PV Systems in the Future

Objectives

By extracting essential knowledge from the Subtask VIII/4, detailed practical instructions and training kit for the development of other practical project proposals, to enable others to sustainable implement VLS-PV systems in the future.

Activities

Taking into account practical experiences and governmental, financial and economic requirements for large energy and development projects, guidelines for the development of practical project proposals will be developed for use in Subtask VIII/4. By extracting essential knowledge from the Subtask VIII/4, these guidelines will be modified into detailed practical instructions and training kit for the development of other practical project proposals, to enable others to sustainable implement VLS-PV systems in the future. These instructions will comprise non-technical issues such as long-term financing as well as technical issues.

Subtask leader

The Netherlands

Results

- IEA Technical Report: Guidelines for practical project proposal for a VLS-PV system
- International Seminar

Participation

All participating countries

5. Time Schedule and Efforts

	1999	2000	2001	2002	**2003**	**2004**	**2005**
Subtask 1	40						
Subtask 2		50	30				
Subtask 3			20	50			
Subtask 4					**20**	**20**	**20**
Subtask 5					**20**	**20**	**20**
Total	40	50	50	50	**40**	**40**	**40**

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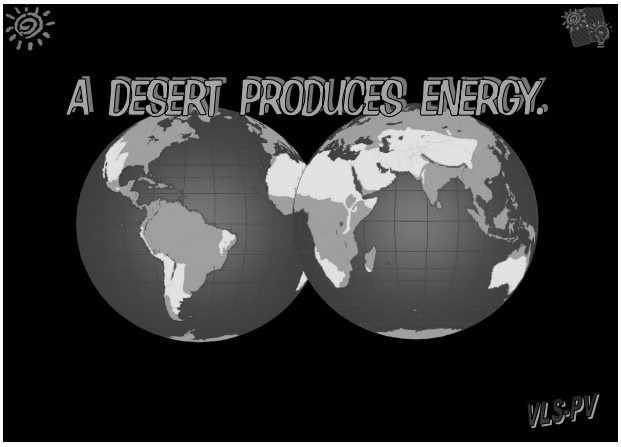

DESERT PRODUCES ENERGY

Final Report of Task VIII - Phase I
to be published by James and James

256 page text + 32 page executive summary
+ 3 page comprehensive summary

Part I: Background and Concept of VLS-PV
Part II: VLS-PV Case Studies
Part III: Scenario Studies and Recommendation

VLS-PV

DESERT PRODUCES ENERGY

SPECIALTIES

Original Works developed by real international cooperation

Kinds of VLS-PV Case Studies:
- Gobi by LCA approach
- Sahara based on IT-X + NL-TF + JP-model including Technology Transfer Scenario and I-O Analysis
- Negev Concentrators by JP-model

- *Sustainable Development Scenario*
- *Financial / Organisational Sustainability*

VLS-PV

TASK VIII Phase-1 Study

1: Conceptual Study
- background and Concept of VLS-PV
- Existing Information
- Environmental issues.
- Site-dependent parameters: irradiation, climate conditions, ...

2: Case Studies for Selected Regions
- Selected 6 regions for case studies.
- VLS-PV in Gobi by LCA Approach
- VLS-PV in Sahara with Technology Transfer
- VLS-PV in Middle East

3: Comprehensive Evaluation
- Sustainable Growth of VLS-PV
- Possible VLS-PV Development Scenario
- Financial and Oraganisational Sustainability
- Recommendations

VLS-PV

TASK VIII Phase-1 Study

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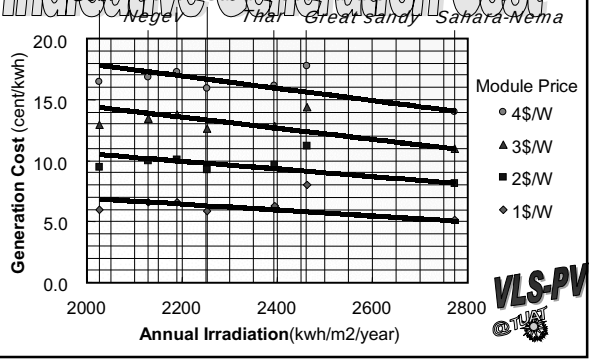
Indicative Generation Cost (US¢/kWh)



VLS-PV

Detailed Case Study for Gobi
Methodology of Evaluation

Life-**C**ycle **A**nalysis (**LCA**) approach employed.

VLS-PV requires energy and raw materials in its life-cycle *i.e.* Manufacture, Transportation, Construction, Operation, decommissioning

3 kinds of Life-Cycle indices are evaluated:

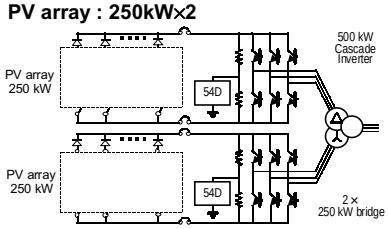
Generation Cost

EPT

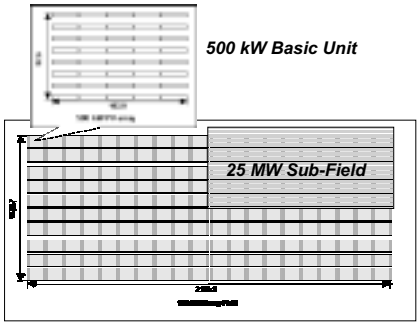
CO_2 Emission Rate

BASIC ELECTRICAL UNIT

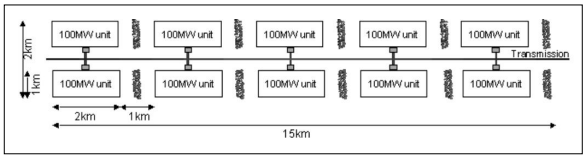
- **Total capacity for plant design: "100MW"**
- **Array structure: "fixed flat array"**
- **Capacity of unit DC system: "500kW"**
  DC input to inverter : DC500V
  PV array : 250kW×2

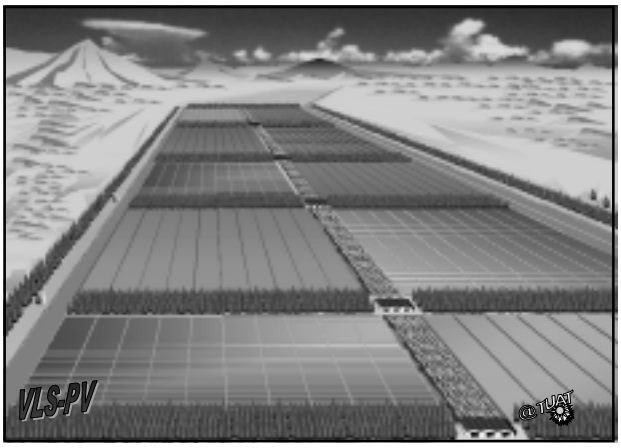


PV Array Layout *100MW PV array field*

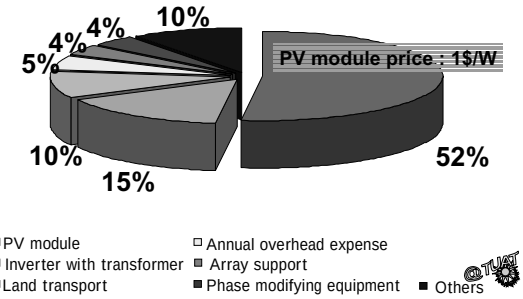


Layout Example of 1GW PV Power

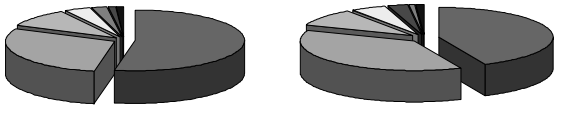




Evaluated Results ~Cost reakdown~



Evaluated Results
*~**EPT** and **CO_2 emission**~*



Breakdown of **Energy**

Breakdown of **CO_2 emission**
(Wide model, 30º)

■ PV module ■ Array support ■ Land transport
□ Foundation ■ Trough ■ Cable ■ etc.

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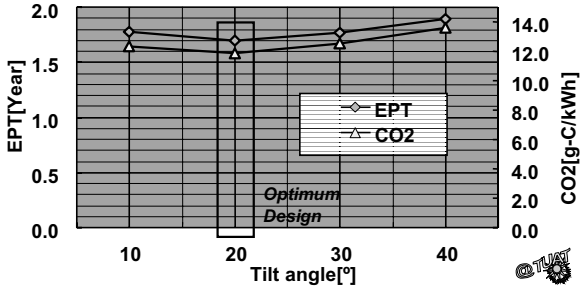
Evaluated results EPT & CO_2 emission rate

Average CO_2 emission rate of utility in China = 260g-C/kWh



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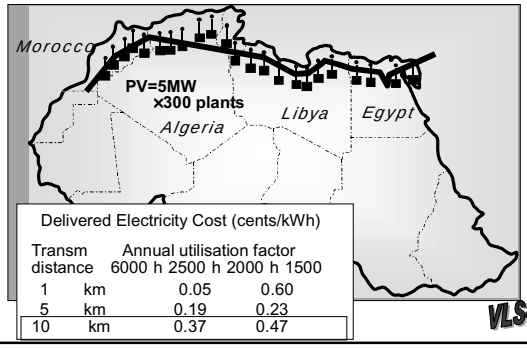
transmission scenario
- small PV, dispersed VLS-PV

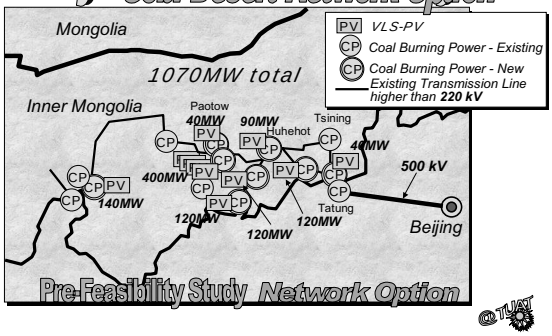


Delivered Electricity Cost (cents/kWh)

Transm distance		Annual utilisation factor 6000 h	2500 h	2000 h	1500
1	km		0.05		0.60
5	km		0.19		0.23
10	km		0.37		0.47

VLS-PV

PV Systems for 21st Century VLS-PV
Gobi Desert Network Option



Pre-Feasibility Study Network Option

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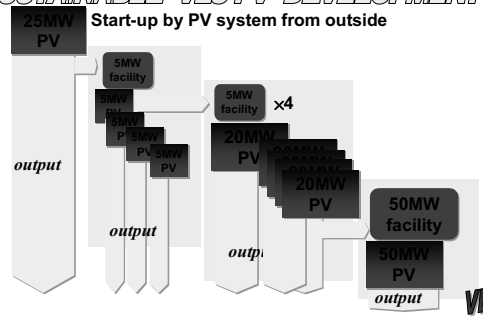
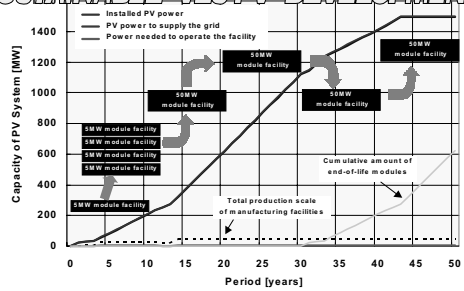
Task VII VLS-PV Report, 2nd Edition
SUSTAINABLE VLS-PV DEVELOPMENT



VLS-PV

Task VII VLS-PV Report, 2nd Edition
SUSTAINABLE VLS-PV DEVELOPMENT



Lifetime: PV system=30yrs., facility=10yrs.

VLS-PV

Task VIII General Understandings

(1) VLS-PV can contribute substantially to global energy needs

- *The world's deserts are so large that covering all of them by 50% with PV would generate 18 times as much as the primary energy supply of 1995.*
- *All global energy scenarios project PV to become a multi-GW generation energy option in the first half of this century.*

VLS-PV

Task VIII General Understandings

(1) VLS-PV can contribute substantially to global energy needs

(2) VLS-PV can become economically and technologically feasible

- *Electricity generation costs are between 0,09 and 0,11 US cent/kWh, mainly depending on annual irradiation levels (with module price 2 USD/W, interest rate 3%, salvage value rate 10%, depreciation period 30 years). These costs can come down by a factor of a half or a quarter by the year 2010.*
- *The PV technology is maturing with increasing conversion efficiencies and decreasing prices per W. Projected prices of 1,15 USD per W around the year 2010 would enable profitable investment and operation for a 100 MW PV plant.*
- *Solar irradiation databases now contain detailed information on irradiation in most of the worlds' deserts.*

VLS-PV

Task VIII General Understandings

(1) VLS-PV can contribute substantially to global energy needs

(2) VLS-PV can become economically and technologically feasible

(3) VLS-PV can contribute considerably to the environment

- *The life-cycle CO2 emission is as low as 13 g-C/kWh; this is mainly due to the module production and the array support. C.f., 200 g-C/kWh for just the fuel component of conventional fossil-burning power plants.*
- *Environmental issues for which VLS-PV may provide a solution contribute are global warming, regional desertification, and local land degradation.*

VLS-PV

Task VIII General Understandings

(1) VLS-PV can contribute substantially to global energy needs

(2) VLS-PV can become economically and technologically feasible

(3) VLS-PV can contribute considerably to the environment

(4) VLS-PV can contribute considerably to socio-economic developmnt.

- *Plant layouts and introduction scenarios are available in preliminary versions. I/O analysis concluded that 1,250 to 1,500 man-years of local jobs will be created per km2 of PV produced and installed.*

VLS-PV

Task VIII General Understandings

(1) VLS-PV can contribute substantially to global energy needs

(2) VLS-PV can become economically and technologically feasible

(3) VLS-PV can contribute considerably to the environment

(4) VLS-PV can contribute considerably to socio-economic developmnt.

(5) VLS-PV development needs a long-term view and consistent policy.

- *Toward a 1 GW system, four intermediate stages recommended: R&D, Pilot, Demonstration and Deployment.*
- *In the concept of sustainable local economic growth, a 1,5 GW VLS-PV after approx. 40 years, will be in operation and give employment/economy sustainably by local manufacturing for replacement.*
- *A view to financing distribution toward the final commercial stage developed. Direct subsidies will play an important role in the first stages.*

VLS-PV

Task VIII Possible Approaches toward VLS-PV

S-0: R&D stage (4 years)
- 500kW×5 research systems
- 4 USD/W PV module
- Imported PV module
- Imported Inverter

S-1: Pilot stage (3 years)
- 25MW pilot PV system
- 3 USD/W PV module
- Imported PV module
- Imported Inverter

S-2: Demonstration stage (3 years)
- 100MW large-scale system
- 2 USD/W PV module
- PV module by Domestic/regional production
- Imported Inverter

S-3: Deployment stage (5 years)
- Sustainable 1GW VLS-PV system with energy network
- 1 USD/W PV module
- PV module by Domestic/regional production
- Inverter by Domestic/regional production

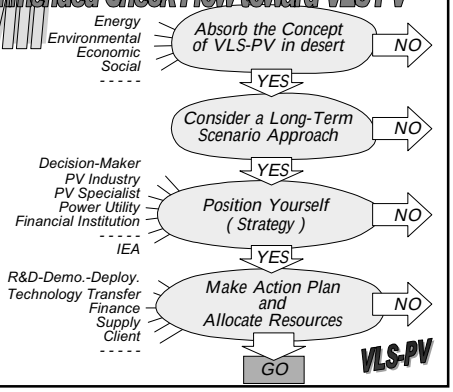
VLS-PV

Task VIII Considered Stakeholders

- *General public*
- *Decision-makers in industrialised countries*
- *Decision-makers in developing countries*
- *Decision-makers in oil-exporting countries*
- *Financing institutions and banks*
- *PV industry associations and multi-national industries*
- *Academic societies and specialist networks*
- *Power utilities*
- *International Energy Agency*

VLS-PV

Task VIII Recommended Check Flow toward VLS-PV



VLS-PV

Task VIII Recommendations on a Policy Level

- *National governments and multinational institutions adopt VLS-PV in desert areas as a viable energy generation option in global, regional and local energy scenarios*
- *The IEA-PVPS community continues Task VIII for expanding the study and refining the R&D and pilot phase and for involving participation by desert experts, financial experts and for collecting further feedback information from existing PV plants.*
- *Multilateral and national governments of industrialised countries provide financing to generate feasibility studies in plural desert areas around the world and to implement the pilot and demonstration phase.*
- *Desert-bound countries (re)evaluate their deserts not as potential problem-areas but as vast and profitable (future) resources for sustainable energy production. The positive influence on local economic growth, regional anti-desertification and global warming should be recognised.*

VLS-PV

Task VIII to Decision Makers in indutrialised Countries

- *Have you considered the future possibility of VLS-PV for your industries, which may become major enterprises controlling the world energy market?*
- *Did you develop a step-by-step plan for R&D, for making good use of the extensive capabilities in photovoltaic technology when the world energy problem arrives?*
- *Did you develop a view to initiate, continue and extend bi- or multi-lateral international collaboration with those developing countries which have abundant solar energy?*
- *Do you have funds available for R&D or pilot programmes with training courses for introducing PV technology into developing regions, especially around deserts as a first stage of a consistent step-by-step approach?*
- *Do you have strategies in place to maintain its regional sustainability and to consider a moderate technology transfer scenario when planning the further development of DCs?*
- *Have you considered using your influence to mobilise multilateral institutions to stimulate VLS-PV?*

VLS-PV

Task VIII to Decision Makers in Developing Countries

- *Have you considered the possible opportunity that your country will be able to export PV energy to neighbouring regions and that the new jobs will be brought to your people?*
- *Are you aware of the fact that PV technology has already been proven itself to be as a cost-competitive energy source for rural electrification and still is being improved very rapidly? As a matter of fact, I it is especially effective for stabilising rural lives.*
- *Have you considered a regional development plan which utilises abundant electricity production and vast land?.*
- *Have you settled a step-by-step, long-term approach that starts with Solar-Home-Systems or Mini-Grids as the first stage and finally reaches VLS-PV in 20 or 30 years?*
- *Do you have a plan to cultivate and raise gradually a domestic PV specialists society from an early stage to a developed stage?*
- *Have you already asked for support from a variety of financial units you can utilise?*

VLS-PV

Task VIII to Decision Makers in Oil-rich Countries -1

- *You obviously are aware of the fact know that many oil-exporting countries around desert areas also have an everlasting natural resource: solar energy. But aAre you conscious that you can export PV energy to neighbouring regions as well?*
- *Are you aware of the fact that PV technology has already been proven as a cost-competitive energy source for rural electrification and is still being improved rapidly?*
- *Did you develop a long-term view of the future world energy market and your strategy including the new elevation of photovoltaic power plants and industries? It will bring you opportunities for high-tech industries and new jobs..*

VLS-PV

Task VIII to Decision Makers in Oil-rich Countries -2

- *Can you confirm the study results that a 100 MW PV power plant will be economically attractive in an oil-exporting country? Have you found out good conditions in interest rates, the value of green certificates and the value of opportunity benefit from oil-saving?*
- *Have you decided to invest in the development of the world photovoltaic business?*
- *Did you choose an appropriate scale for starting toward VLS-PV?*

VLS-PV

Task VIII to Finantial Institutions and Banks

- *Can you positively support a full-scale feasibility study for a pilot project and for a 100 MW demonstration plant as a continuation of the Task VIII? - It will identify targets and locations and will secure the funding sources and electricity outlets for both stages.*
- *Can you support the pilot stage and the 100 MW demonstration plant according to the results of this study?*
- *Could you consider a low-interest soft loan on a long-term basis for the initiation of VLS-PV system projects around desert areas?*

VLS-PV

Task VIII to PV Industries

- *You are obviously conscious of possibilities that the future market growth will be larger in southern countries, mainly because of their availability of much sun and much land.*
- *Are you aware of the future possibility of VLS-PV for PV-industries? - They may become major enterprises controlling the world energy market.*
- *Are you confident that the photovoltaic technology and market will become competitive on a worldwide level within 20 years from now?*
- *Can you make sure that the prices for Solar PV Energy will be reduced by a factor of half to a quarter within the next decade?*
- *Can you support and invest in local industries for taking off according to technology transfer scenario?*

VLS-PV

Task VIII to PV Specialists and Academic Societies

- *You know that fundamental research will generate new seed technologies for VLS-PV? Can you confirm that expected directions are such as very high efficiency PV cells, high-concentration optics, organic-polymer PV cells, chemical energy transportation media like hydrogen or methanol, superconducting power transmission and so on?*
- *Did you formulate and assist to a PV specialist society in developing countries in cooperation with top leaders in those countries?*
- *Do you join our continuing works, seeking for the realisation of VLS-PV systems? - Expected work items may include more precise case studies for specific sites and funding, proposals for R&D cooperation plans, other possibilities in technological variety, resource evaluation, additional value analysis and so on.*

VLS-PV

Task VIII to Power Utilities

- *You have clearly recognised that the world energy market structure will change very drastically in the near future.*
- *Can you confirm business opportunities in photovoltaics within the next decades.?*
- *Can you confirm that a power transmission scenario is possible according to our study results? - Additional tie-line construction of less than 100 km, for connecting VLS-PV through existing national power grids to a load centre, will raise the electricity price with less than 1 US cent/kWh. One example is a transmission operation in cooperation with coal burning power stations located on a colliery.*
- *Are you ready for investing in photovoltaic industries and foster technological societies with a long-term view for the future world energy market?*

VLS-PV

Task VIII Recommendations to IEA -1

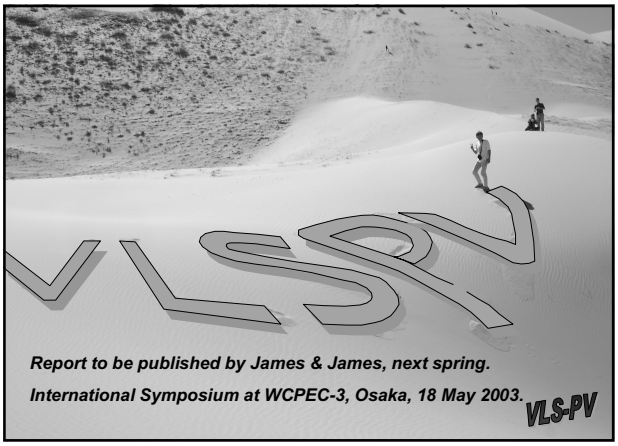
- *You are clearly conscious that the diversification of energy resources and the development of alternative energy are essential for overcoming the world energy problems within the next decades.*
- *Can you confirm our view that Solar PV Energy is one of the most favourable options for future electricity production?*
- *Can you confirm your continuous support for the IEA PVPS Implementing Agreement on the basis of a long-term world energy outlook?*
- *Would you support our idea about multilateral activities between IEA member countries and developing countries?*
- *Can you organise the higher level of IEA PVPS activities including demonstration projects for VLS-PV?*

VLS-PV

Task VIII Recommendations to IEA -2

- *Do you want to support a full-scale feasibility study corresponding to a pilot project and a 100 MW demonstration plant? - It will identify targets and location and fully secures funding sources and electricity outlets for both stages.*
- *Can you support and enhance the continuing works in the IEA PVPS Task VIII? - Expected work items are to be:*
  - *More precise case studies for detailed local conditions, funding sources, demand application...*
  - *The first or second stage of cooperation plans to be submitted to financial institutions,*
  - *Other possibilities such as tracking, concentrator and advanced PV cells, resource evaluation by remote sensing.*
  - *Additional effect on the global warming and desertification,*
  - *Expansion of evaluating approaches to other type of PV mass-applications in the 21st century.*

VLS-PV



Report to be published by James & James, next spring.

International Symposium at WCPEC-3, Osaka, 18 May 2003.

VLS-PV

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Meeting for IEA CONFERENCE

Unconfirmed Personal Memorandum

Original: 021009
modified: 021023
Kosuke Kurokawa

Date: 17 October 2003, Thursday ..... 9:00 - 11:00
Place: Royal Hotel, Antibes
Meeting Members:
Nowak, Hashimoto, Hasset, McNelis, Kato, Kimura, Kurokawa, Harada, Komoto
Agenda:
1. Issues to be discussed after ExCo Decision
   - Next Urgent Actions
   - Schedule of International Conference Committee
   - Role of Bernard
   - Conference Committee
   - Official Letter Exchange
   - Support by Organisations
2. Concept Paper
3. Action Items

< Issues to be discussed after ExCo Decision >

Next Urgent Actions

1. Establishment of conference committee
→ IEA, ExCo members. EPIA, SEIA, (JPEA)
2. Official Letter exchange between Stefan and Hashimoto
3. Completion of concept paper
→ title
→ programme ....speaker

Schedule of International Conference Committee
→ once at least .... Jan 2003 ? Paris ?

Role of Bernard
Kato: We expect him to act as Adviser for JP side and to negotiate with oversea speakers and to call for overseas participations.
Stefan: Agreeable! Include setting-up of paper work.
Bob: Bob also expects Bernard to appeal US people when he visited US.
Stefan: The ExCo common fund is payable for his work. It is necessary to list his duties.
Bob: US does not expect much expense for US matters by Bernard.
Bernard: Bernard will estimate his job and expense.
.....

Next actions of Japanese side
- conference flyer (1st announcement)
- reservation of venue including ExCo meeting

Conference Committee
- Conference Committee members:
Stefan, Co-Chairperson

Hashimoto, Co-Chairperson
Schaap
Bob
Bernard
Neef from IEA HQ
???? from EPIA
Gren(n) Hamer from SEIA ... Director .... Bob may act for him sometimes.
Greg Watt ???? .... Stefan will confirm.

- Official letters to Member are necessary with Hashimoto's Signature. (Bob pointed out.)
The conference should be planned on the same steram as Exec. Conference, but the conference itself is different from the Exec. Conference.
The official letter for committee members will include the Concept Paper, which may be a tentative version modified from this discussion in Antibes.

- free discussions -
Bob: The final version has to be also settled as far as possible in parallel.
Stefan: Keep it as simple and short as possible.
Bob: "IEA PVPS CONFERENCE"
Stefan: … with sub-title.
Kato: Simplification of the concept paper is agreeable.
Kato: Kato will prepare the simplified version with e-mail communications for the confirmation.
Stefan: Conference Committee, now OK? YES by all.

Official Letter Exchange

Stefan: The Official Letter is sent to Japan according to the approval of ExCo.
Hashimoto: I request the letter stating Host by Japan and ExCo decision.
Hashimoto: Based upon Stefan's letter, Hashimoto will reply according to consultations with METI.

Support by Organisations

Stefa: Add 'supporting organisation' to agenda. ... definition of support, official letters
Stefan: What is Support by IEA ?
Hashimoto: No need for financial/ personnel supports, just with their name and one welcome speech in the Conference.
Stefan: Stefan will ask Neef to join the Conference Committee and then the use of Name automatically becomes acceptable. But some negotiation might be necessary for Logo. (Stefan in charge for solution.)

Stefan: Question for the use of name EU ? → EC
Bernard: WCPEC-3 is using the name - EC.
Stefan: If impossible for the use, then we can skip it because the name of IEA seems to be sufficient in this case. .... OK.

<Concept Paper>

Stefan: In terms of Background, 1st and 2nd paragraphs seem to be necessary. 3rd paragraph must be shorter. 4th necessary. 5th ... In the last, UN has to be removed.

Objective

Stefan: Objective must be much sharper. Focus on 10 yrs. of IEA PVPS and its direction. ..... (Discussions to confirm basic idea.)
Kato: The conference objective became much improved to focus 'timely' occasion. Thanks for our consensus on the objective.
Bob: I want to hear opinions from industries about PV future.

Stefan: G8 Task Force is not a part of industry. Its vision can be included in this programme.
Stefan: Main target audience must be as presented at ExCo yesterday. Remove researchers.
Stefan: Non-exec. conf. Replace 'Executives' by 'Representatives'.
Stefan: No description about ExCo meeting in the flyer.

Programme
Stefan: Discuss today about session by session.
Session 1: as it is now.
Session 2: Achievement of PVPS
Presentation by Vigotti: is more appreciate for broader perspective in comparison with renewables.
Kato: In concept paper, only session names are to be described. .... OK.

National Programmes and Industry views have to more balanced including discussions.
Kato: Discussion are to be made on the second day morning.
Stefan: Interaction is necessary to make this conference attractive. Discussions about the needs of PV are welcome.
Bernard: What about 'Rapporteur' system?.
Bob: Outcomes must include vision, needs, why implementing by respective sector.
.....
Stefan: Presentation and about 30 minutes discussion.
Stefan: (Open or close) .....Discussions are more welcome and 2 day also have to be open. shop ... OK!
Full-Open-shop may be acceptable by each side ?! (confirmed)

<Action Items>

Bernard: Is it possible to utilize WCPEC-3 Osaka meeting in December?
Stefan: Difficult in December. Face-to-face discussions among some people seem to be very effective.
Stefan: Before the programme is determined, we should meet in early January.

1)	Early December	Pre-conference registration starts.
2)	End of January 2003	International Conference Committee Meeting (at Paris ?) - Conference program and schedule confirmed: **17 Jan., Friday in Paris** (tentative schedule).
3)	Early February 2003	Request made for the submission of speech abstract (NEDO/PVTEC)
4)	Early March 2003	Brochure containing all details (including conference programs) produced and distributed (NEDO/PVTEC)
5)	Late March 2003	Deadline for speech abstract and pre-conference registration
6)	Late April 2003	List of speech abstract compiled and printed (NEDO/PVTEC)

<end of meeting>