

*LifeLong Learning for Energy security,  
access and efficiency in African and  
Pacific Small Island Developing States*

**L<sup>3</sup>EAP**

## **L<sup>3</sup>EAP – Results of Work Package 2**

# **Integrated Findings and recommendations from Fiji, Mauritius and Germany**

*Assessment of Needs for Lifelong Learning in the Energy Sector /  
Assessment of Needs for Capacity Building of University staff*

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# 1 Introduction

Project L<sup>3</sup>EAP (Lifelong Learning for Energy Security, Access and Efficiency in the African and Pacific Small Island Developing States) is a project of the ACP-EU Co-operation programme in Higher Education (EDULINK II) whose aim is to increase the capacity of Higher Education Institutions (HEIs) in the African, Caribbean and Pacific (ACP) SIDS to deliver high-quality Lifelong Learning courses on the topics of energy access, security and efficiency.

By its focus on energy security, access and efficiency, L<sup>3</sup>EAP addresses a topic that is most relevant for the local labour market and socio-economic development in the regions of its application. Through its focus on the Small Island Developing States (SIDS), L<sup>3</sup>EAP supports countries where energy access, security and efficiency play a central role in the achievement of a sustainable socio-economic development, especially because of the high dependence of these states on imported fossil fuels.

The project is undertaken by a consortium of three universities comprising Hamburg University of Applied Sciences (HAW), Germany, University of Mauritius (UoM) and the University of the South Pacific (USP). The project has six work packages which are implemented by partner universities in the course of the three-year project. These work packages are defined below, together with which partner university is responsible for each work package.

- I. Project management and monitoring (HAW)
- II. WP2: Assessments for Needs in Energy Sector & Assessments for Needs in Higher Education Institution Staff in Partner Institutions (the University of the South Pacific (USP)).
- III. WP3: Develop Course Outline in energy security, access and efficiency (USP)
- IV. WP4: Develop pilot modules, implement pilot modules and evaluate pilot modules in energy security, access and efficiency (The University of Mauritius (UoM))
- V. WP5: Carry out staff capacity building seminars in energy security, access and efficiency (UoM)
- VI. WP6: Dissemination, networking and technology transfer (HAW)

This report represents a key output of the second work package. This work package had two distinctive objectives:

- Energy Needs Assessment: Determine training needs of energy practitioners in the areas of energy access, security and efficiency (EASE); and
- Capacity-Building Needs Assessment: Determine capacity building needs of HEI staff that would be involved in teaching and administration of the courses developed as a result of the above analysis.

Thus, data on the training needs of energy practitioners were collected and structural and institutional barriers to the development and teaching of effective LLL courses in EASE by HEI staff were identified. Moreover, a survey of the capacity building needs of the HEI staff was conducted in the African and Pacific partner regions.

The energy needs assessment study was carried out by means of two distinctive two surveys. The first survey focused on energy sector practitioners whereas the other survey focused on Higher Education Institution Staff. In a decentralized approach, the three partners (HAW, USP and UoM) conducted own investigations on energy needs assessment study by distributing survey questionnaires to relevant sector representatives, collecting the information in an effort to produce specific local WP2 reports for each region. This integrated report consolidates the results of the three separate studies to obtain a collective perspective of the energy training needs of the three regions.

## 2 Methodology

Data was acquired via two surveys as well as by other means. The energy sector survey investigated the views of energy practitioners on which areas of energy use they required training and up-skilling (see 2.1). The staff survey sought the views of the prospective trainers on their capacity building needs for the task (see 2.2). In addition, other (open-ended) data-gathering means were used as described briefly below (see 2.3). A separate investigation was carried out of the possible structural and institutional factors that could act as barriers to the success of the training process (see 2.4). In addition to this formal means of data collection, informal methods including visits to workshops and seminars as well as personal interviews were also utilized.

### 2.1 Energy sector survey

The energy sector survey consisted of seven questions. The first two questions gathered the basic statistical data of the respondents and their understanding of the basic concepts of energy use, including energy access, security and efficiency. The next question gathered self-evaluations of their own knowledge in these key areas. Question four enquired whether they wished these topics to be included in a training course. Also, respondents could add further topics of interest. The last two questions enquired about the respondents' preference for the preferred mode of delivery of the proposed course, and gave them the opportunity to add any further other comments of their own.

### 2.2 Staff survey

The staff survey was similar to the energy sector except that it contained an additional section on the training needs of staff involved in the development, implementation and promotion of lifelong learning courses similar to the proposed course. The specific questions in this section were directed towards knowledge in curriculum development, teaching module development, e-learning (online learning), and costing, financing and marketing of courses.

### **2.3 Data collection**

The conventional means of data collection through formal surveys has a serious limitation, e.g. interviewer bias, as it tends to restrict the range of questions asked (and the data gathered) to those which are obvious to the investigator. This may lead to important information (energy training needs in the present case) not being considered. An alternative approach is a novel methodology that leaves the questions open-ended, or does not ask specific questions. This method also referred to as Contextual Data Discovery expands the scope of gathered information that is relevant to the problem, and supplements the results gained from a structured survey alone. The final outcomes of the present needs analysis reveals the utility of this two-pronged approach to data gathering.

### **2.4 Survey of structural and institutional barriers**

The investigation of the possible structural and institutional barriers was carried out through a desktop study of relevant literature, including institutional handbooks, calendars, planning and curriculum documentation.

## **3 Results**

### **3.1 Energy sector survey**

#### **Needs of energy practitioners**

There were 29 respondents from the Pacific region (USP), 32 from the African region (Mauritius) and 29 from Germany (HAW) to the energy sector survey. They ranged from academics, energy department officers, utility CEOs to NGOs and the private sector. All had generally good understanding of energy use, i.e. knowledge of energy access, security and efficiency (EASE) except in the areas of energy policy and legislation. The results detailing these knowledge levels for the three regions, as carried out by The University of the South Pacific (USP), University of Mauritius (UoM) and the Hamburg University of Applied Sciences (HAW Hamburg) are presented below.

#### **Understanding the concepts**

In general the participants showed that they were quite familiar with the concepts of energy access, security and efficiency. Participants had similar understanding of the term energy access, associating it with reliability and availability. They associated energy security with sustainability and affordability. Energy efficiency was mostly associated with appliances and buildings, and the process of using less energy for the same output.

### Knowledge Levels in EASE

Participants showed a similar response to the query about their knowledge level in EASE. They all seem to have sufficient knowledge in all areas of EASE except energy policy and legislation. The results are displayed in Figure 1-3 below.

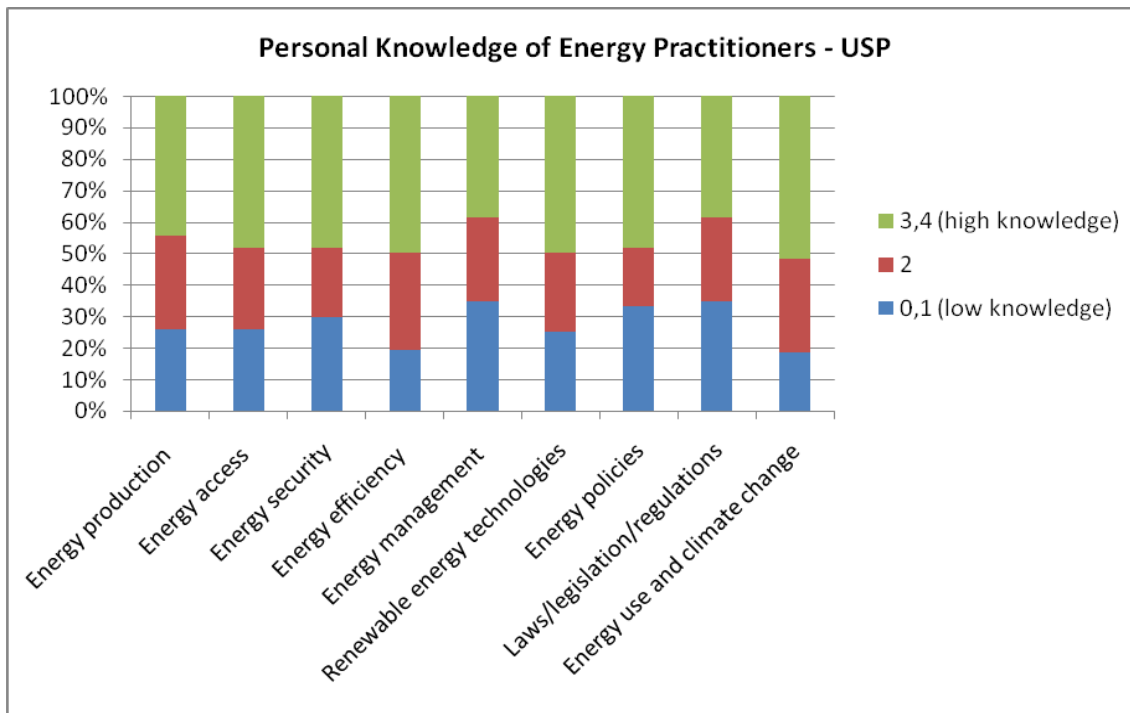


Figure 1: Participants Level of Knowledge of EASE - Fiji

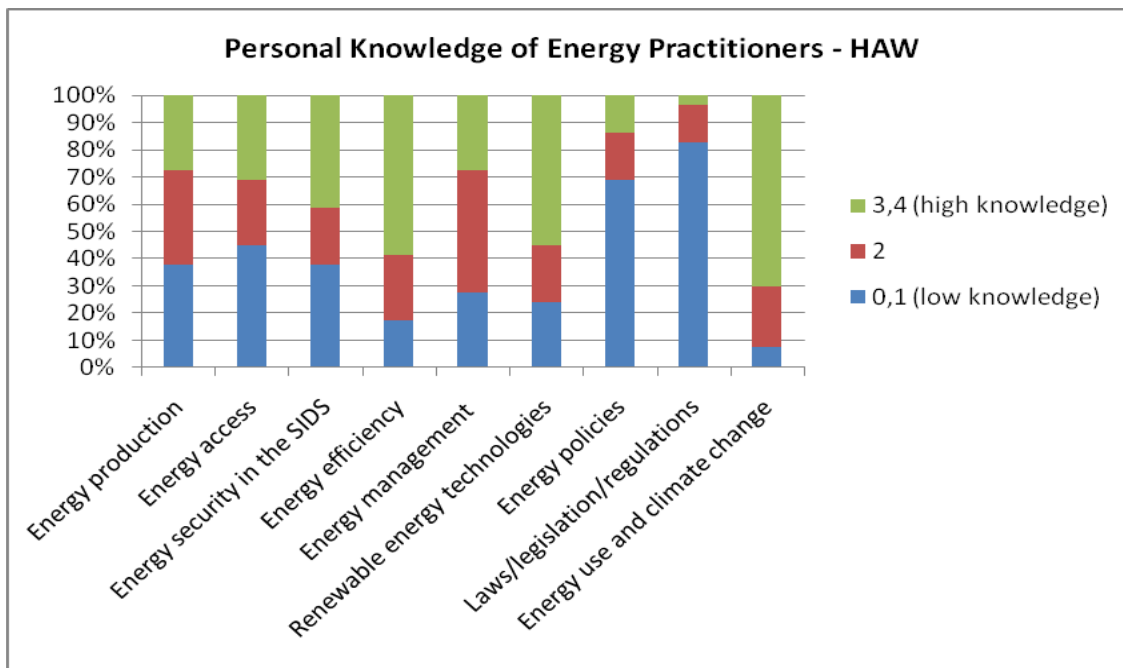


Figure 2: Participants Level of Knowledge of EASE - Germany

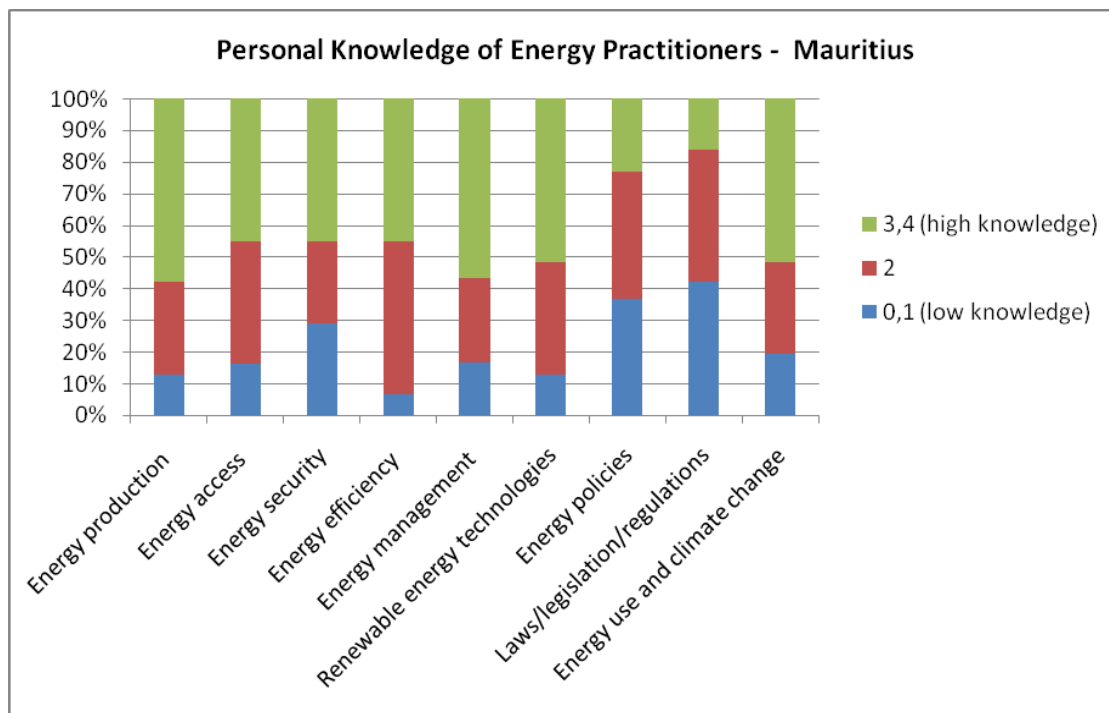


Figure 3: Participants level of knowledge of EASE - Mauritius

### Appropriateness of suggested Topics for the course

Generally all the topics suggested in the questionnaire for inclusion into the programme of study were accepted by the participants as being important.

### New Ideas and Recommendations for New EASE Course Topics

When asked what else could be included in such a programme of study, a wide ranging portfolio of new courses topics were proposed by all. These ideas are summarized in Table 1 below.

Table 1: Suggestions for new topics that could be included in the course of study

(USP)	(HAW)	(UoM)
<ul style="list-style-type: none"> <li>• Energy planning &amp; forecasting</li> <li>• Energy proposal writing</li> <li>• Energy benchmarking</li> <li>• Energy regulation</li> <li>• Energy utilities</li> <li>• Energy efficiency standards</li> <li>• Building codes</li> </ul>	<ul style="list-style-type: none"> <li>• Local potential, consumption, demand and prices</li> <li>• Building regulation</li> <li>• Inclusion of locals in energy production plans</li> <li>• How to implement training courses workshops and capacity building</li> <li>• Implementation of</li> </ul>	<ul style="list-style-type: none"> <li>• Sustainability</li> <li>• Blue economy vs. green economy technologies</li> <li>• Case Studies on energy management and energy efficient industries</li> <li>• Industrial scale EE calculations and energy auditing</li> <li>• Use of simulation</li> </ul>



	renewable energy goals and policy strategy	software <ul style="list-style-type: none"> <li>• Energy and thermodynamics</li> <li>• Green buildings</li> <li>• Grid stability</li> <li>• Cost of RE vs. conventional energy</li> </ul>
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### Proposed application of Knowledge from EASE Course

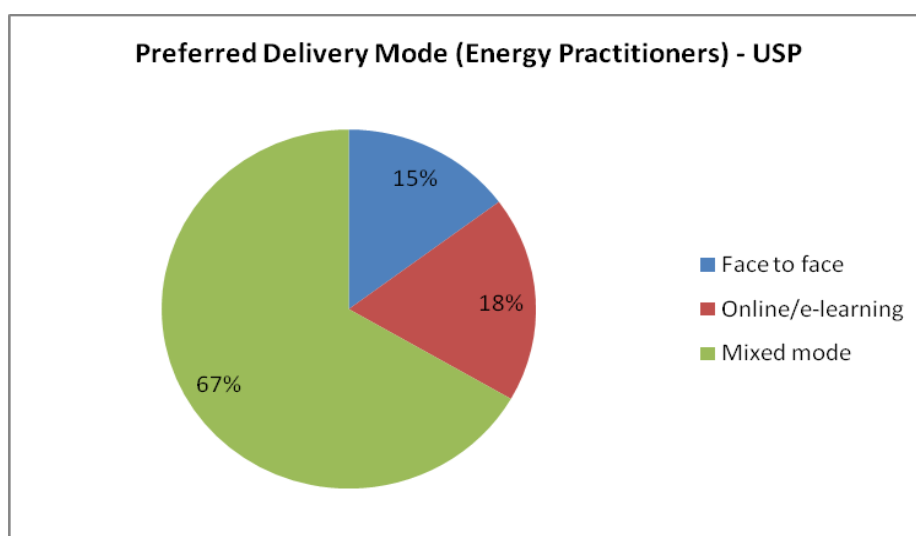
Respondents gave a wide-range of answers to the intended use of the knowledge gained from the proposed course.

**Table 2: Potential utilization of knowledge gained from an EASE course**

(USP)	(HAW)	Mauritius
<ul style="list-style-type: none"> <li>• Advising government</li> <li>• Hiring competent staff</li> <li>• Determination of energy policy – community development</li> </ul>	<ul style="list-style-type: none"> <li>• Consulting, research teaching</li> <li>• Implementing energy concepts in SIDS and off-grid technologies</li> </ul>	<ul style="list-style-type: none"> <li>• Implement energy concepts at work place</li> <li>• Optimization of process or product</li> <li>• Reduce energy losses</li> <li>• Develop energy policies at workplace</li> </ul>

### Preferred Delivery Mode

The large majority of participants preferred a mixed mode of delivery (including face to face and online instructions), as indicated in Figure 4-6 below.



**Figure 4: Participants Preference for Course Delivery - Fiji**

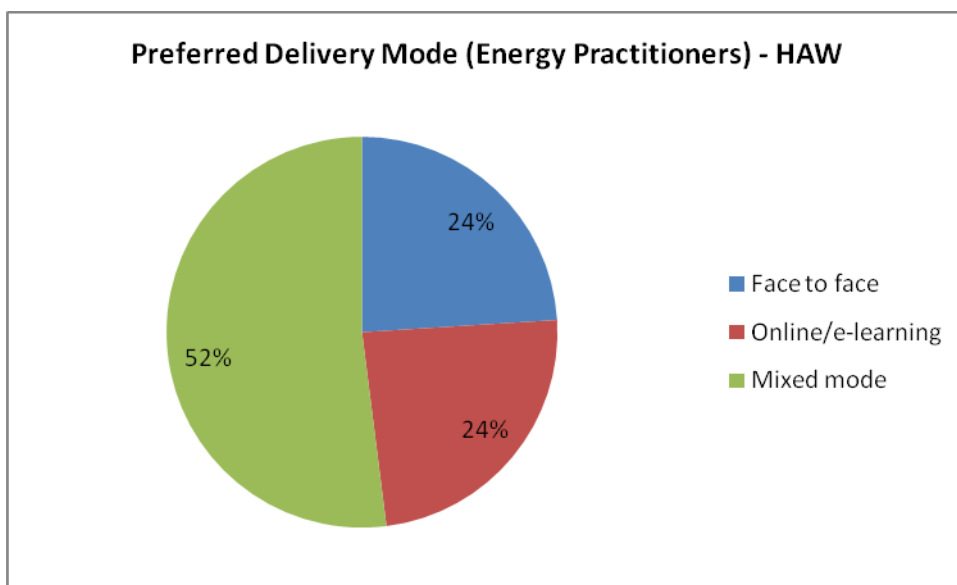


Figure 5: Participants Preference for Course Delivery - Germany

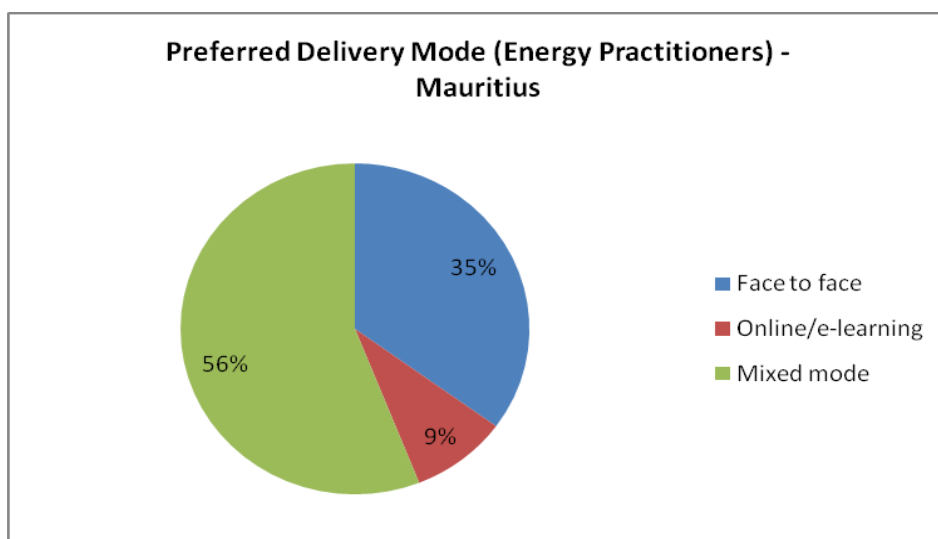


Figure 6: Participants Preference for Course Delivery -Mauritius

### Further Comments

Participants from the three different regions had contrasting suggestions and ideas that they exchanged during the surveys. For instance, the USP participants suggested that there is a need for courses in energy modeling and training of utility workers. The HAW participants were more interested in understanding the teaching of courses conducted in Pacific Island Developing Countries. In Mauritius the participants suggested that economics and sustainability are important trainings needs, and the need to be more focused on practical application, rather than theory.

### 3.2 Results from other activities

During the course of WP2, there were public outreach events held in three regions. These initiatives allowed USP, HAW and UoM to gather additional information from energy practitioners about any new insights, suggestions, experiences or ideas that they could offer. For instance USP participants said that there is a need for training in energy auditing of buildings, and training of personnel for energy financing, recruitment and consulting. HAW respondents suggested that many companies in Germany were not aware of SIDS and their inherent socio-economic characteristics, so that these companies may be interested in looking for local partners to seize business opportunities. ,

### 3.3 Structural and Institutional Barriers

A study of potential barriers to the development and implementation of the planned course of studies revealed several institutional factors that would have a definite impact on how such course or courses could be developed and implemented. The results are summarized in Table 3 below.

**Table 3: Possible institutional and structural barriers to the development of LLL courses in EASE at the three participating institutions**

(USP)	(HAW)	Mauritius
<ul style="list-style-type: none"> <li>• USP’s program structure is not conducive to offering (LLL) courses as a mainstream activity in USP</li> <li>• USP offers credit courses and non-credit courses. Credit courses are senate approved</li> <li>• USP staff does not get credit for teaching non-credit courses</li> <li>• CVCE (Centre for Vocational and Continuing Education) at USP offers non-credit courses</li> </ul>	<ul style="list-style-type: none"> <li>• HAW has special LLL courses (Public Health, Department of Informatics), but this is at an experimental stage – no regulations for developing courses</li> </ul>	<ul style="list-style-type: none"> <li>• LLL courses replaced by continuous professional development (CPD) courses</li> <li>• Different departments offer their own CPD courses</li> <li>• Several departments are working in the area of energy and it might be difficult to bring them under the same umbrella</li> <li>• E-learning has not been tried out for energy courses</li> <li>• Danger of material displayed on the web being plagiarized by other institutions</li> </ul>

### 3.4 University Staff Survey

#### Statistical information

The total number of respondents that participated in the USP staff survey was 14. For HAW and Mauritius the number of respondents was 17 and 18 respectively.

#### Knowledge Levels of EASE amongst HEI staff

As for the case of the energy practitioners, respondents from the universities and other HEI indicated high levels of knowledge in all areas of EASE except energy policies and legislation. The results from the three partner universities are shown below.

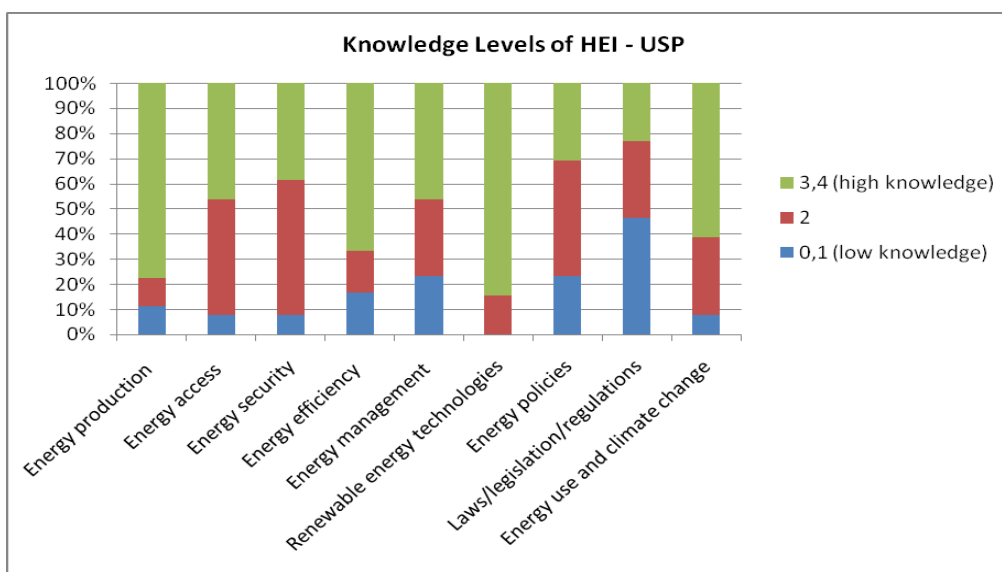


Figure 7: Participants Level of Knowledge of EASE – Fiji

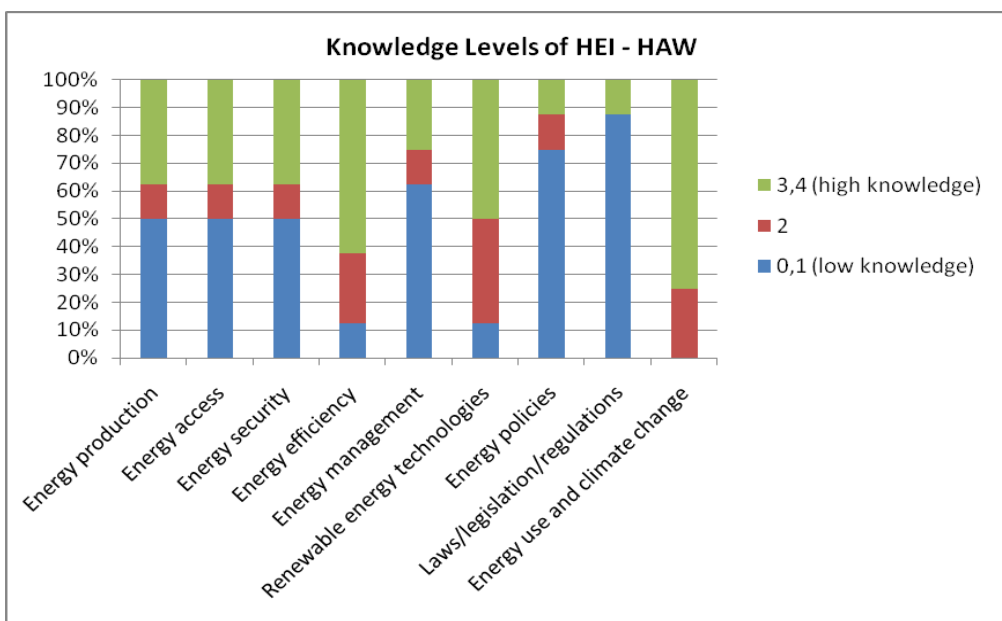


Figure 8: Participants Level of Knowledge of EASE – Germany

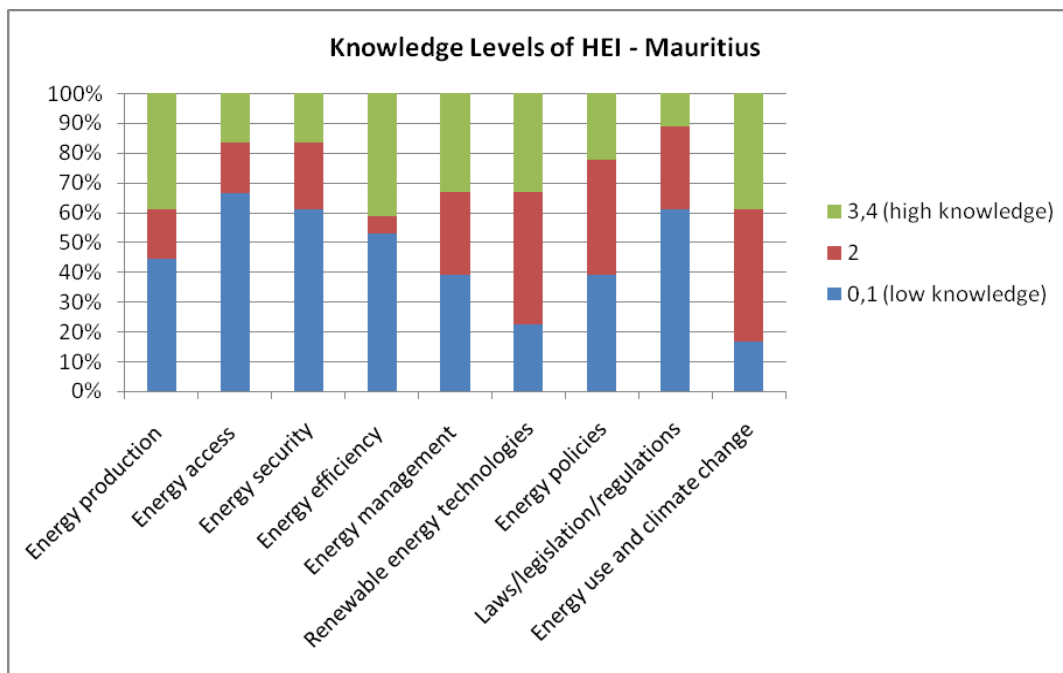


Figure 9: Participants Level of Knowledge of EASE – Mauritius

### Interest in Benefiting from Training in the following areas

The response from all three partner universities was overwhelmingly in favor of developing the course. The results from USP is shown below.

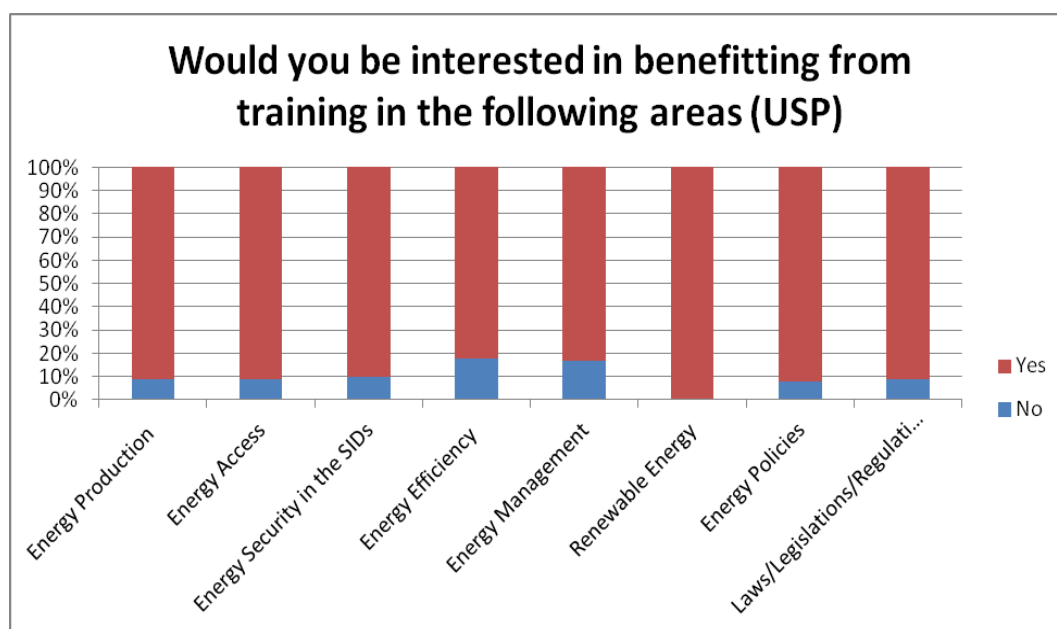


Figure 10: Participants Level of Response to EASE Training – Fiji

## Involvement in Developing and Managing Professional Development Courses

As the number of staff currently involved in developing and managing professional development courses was low at USP (one staff member), the statistical significance of the responses (shown in Figure 11-13) must be treated with caution. There were a total of 8 respondents from Mauritius and 6 respondents from Germany.

## Personal knowledge /experience in LLL

The personal knowledge and experience in lifelong learning courses appeared to be very low, as depicted in Figure 11 and 12 below.

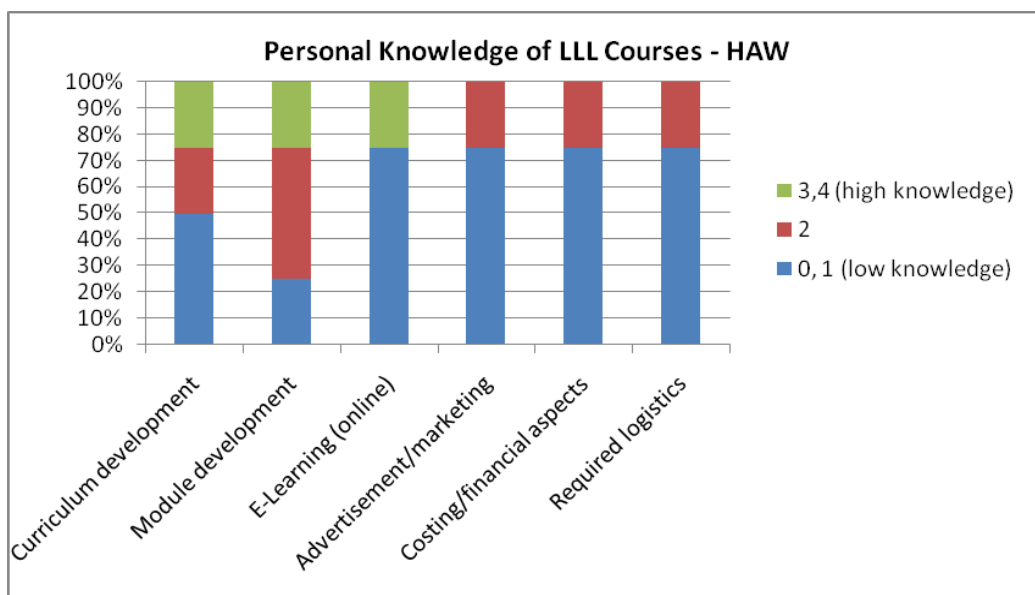


Figure 11: Participants Level of Knowledge of LLL Courses - Germany

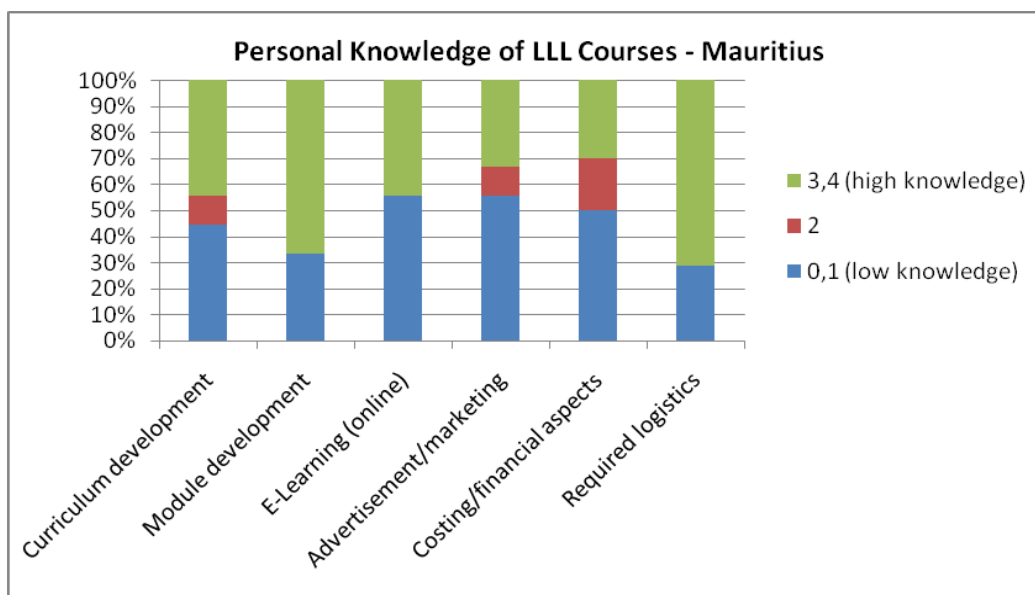


Figure 12: Participants Level of Knowledge of LLL Courses - Mauritius

### Interest in Benefiting from a training course

There were almost similar responses by participants from the three regions to this question addressing the level of benefit the respondents would derive from the proposed training course for the trainers. The USP participants confirmed that they would benefit from such capacity building course, Mauritius participants also answered in the affirmative. There was no response from HAW participants.

### Preferred Delivery Mode

There was a clear preference by staff of all institutions for a mixed mode delivery of the proposed course, as shown in the Figure 13-15 below.

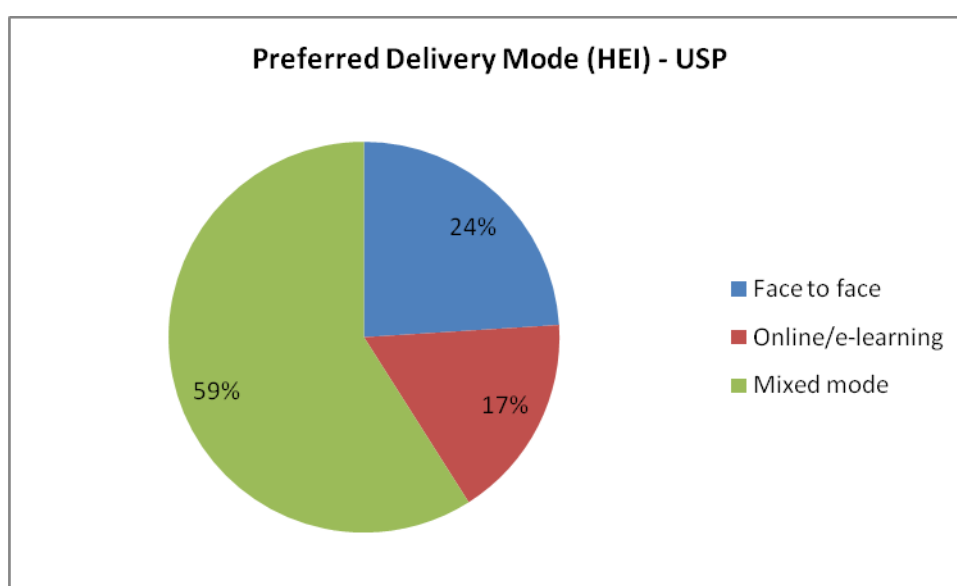


Figure 13: Participants Preference for Course Delivery - Fiji

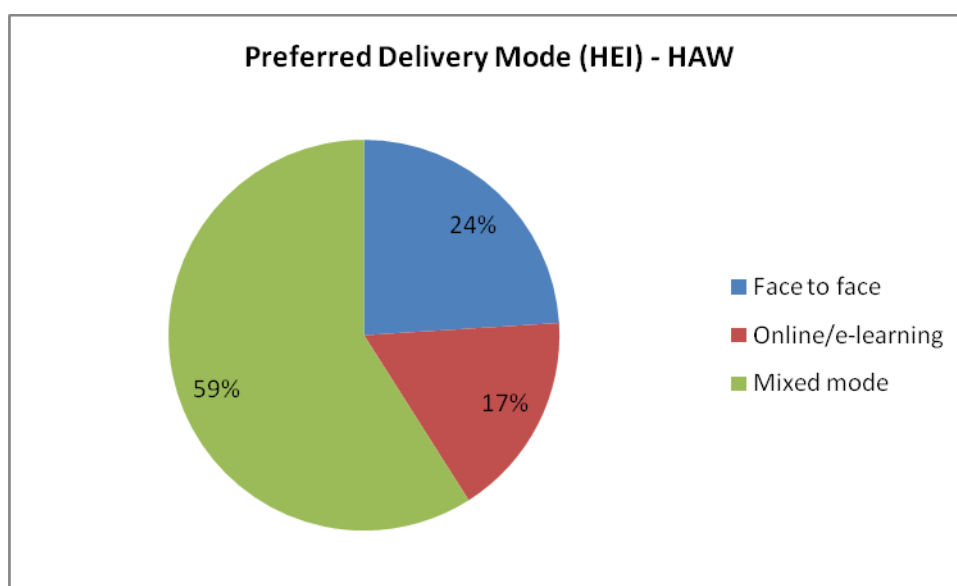


Figure 14: Participants Preference for Course Delivery - Germany

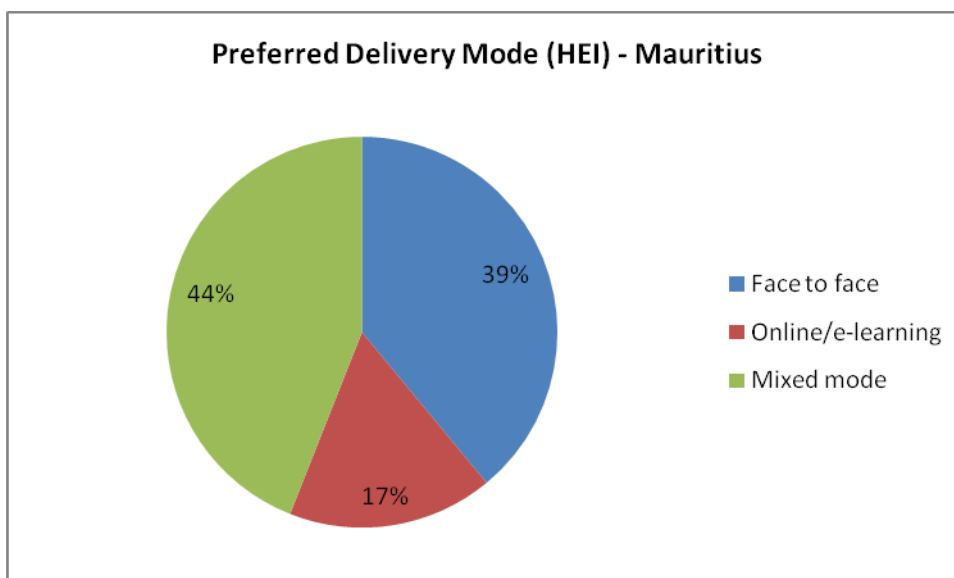


Figure 15: Participants Preference for Course Delivery - Mauritius

## 4 Discussion

The results of the surveys clearly indicate that there is a demand for training in energy access, security and efficiency (EASE) in the African and Pacific SIDS. However, the study reveals that there are also some more specific demands for training in energy use that were not considered in the survey questionnaires. These needs may be broadly categorized into applications of energy efficiency and financing. The latter includes areas such as project funding procurement, and energy project tendering and consultancy.

The data gathering for this needs analysis revealed, amongst other things, that there was a shortage of qualified local personnel (especially in the Pacific SIDS) who could successfully bid for energy tenders and/or provide expert consultancies. As a result, countries due to limited local capacities much of the relevant personnel or organizations operating in these areas are still being recruited from developed.

A single course may represent a valuable starting point for beginning to serve these specific demands as well as the general purpose of offering training in EASE. It is suggested that a more comprehensive capacity-building programme may be needed to meet the entire spectrum of training needs of the SIDS. Judging from the characteristics of the respondents, such courses would need to be:

- i) Short (so that busy energy practitioners and HEI staff could upgrade their skills in a short amount of time);
- ii) Available on demand (trainees can learn in the timeframe available to them); and
- iii) Highly interactive (to accelerate learning).



All in all, these observations point to online courses and short workshop-based courses as the most likely modes of delivery.

This study also revealed that institutional barriers to developing and implementing energy-related courses in universities exist and may represent a constraint to the successful implementation of envisaged EASE training programmes. Until very recently, such modular short-term courses could not be offered as part of the normal curricula of any of the three universities. This was due to the absence of any formal framework for such courses in these institutions. The Hamburg University of Applied Sciences (HAW) evidently offered LLL courses but the survey revealed that these seemed to be at the trial stage only. Mauritius offered professional development courses but they were offered by various sections as non-mainstream courses. Until the start of this year, USP offered technical and vocational courses but they were either non-credit courses or credited by other institutions.

However, the situation at the partner universities appears to be dynamic and changing: At the beginning of this year, USP established Pacific Technical and Further Education (TAFE)<sup>1</sup>, a re-vitalized version of the programme offered by its former Centre for Vocational and Continuing Education (CVCE). This might finally provide the opportunity for a viable and credible programme on energy use in SIDS. Moreover, HAW Hamburg just recently joined the Hamburg Open Online University<sup>2</sup>, an initiative dedicated to providing open access education, and the L<sup>3</sup>EAP Hamburg partner proposed a first EASE course to this initiative.

## 5 Recommendations

A programme of study in EASE may be highly sought-after in the Pacific and African SIDS yet this exercise has revealed that, overall, much progress still needs to be made to produce appropriate courses. The range of subjects to be considered in the EASE course development by the L<sup>3</sup>EAP project partners should be expanded to include:

- Energy efficiency, audits, bench-marking; Energy financing and consultancy; Energy economics and blue-green economy as well as simulation software training.

Because of the diverse nature of these needs, not all topics can be offered in a single module. In the frame of L<sup>3</sup>EAP, a programme of courses could be developed that consists of:

- A generic course in EASE; and
- Specific courses in the distinctive areas of energy efficiency and financing as well as building local capacities for energy consultancy

<sup>1</sup> See [https://www.usp.ac.fj/index.php?id=continuing\\_edu\\_progr](https://www.usp.ac.fj/index.php?id=continuing_edu_progr).

<sup>2</sup> See <http://www.hoou.de/>.

Concerning the recommended scope and mode of delivery, it is paramount to design the courses in a manner that addresses not only the needs of the learners, but also takes into consideration their individual constraints, e.g. time constraints, prior knowledge, depth of knowledge provided etc. For example, the position description of energy practitioners varies from the Corporate CEO level down to an NGO volunteer. The nature of information required will therefore be expected to vary as well, for instance between the know-how required for hands-on familiarity or practical application and to technical expertise and strategic management skills required for high-level decision-making. Moreover, while some trainees will be available for face-to-face class room-based courses, others will be spread over a wide geographical region such as the Pacific and African SIDS. Also, while many practitioners can make time to attend formal class-room-based courses, CEOs may not be able to afford such luxury. Lifelong learning course planning thus needs to consider these aspects in the design of appropriate LLL courses.

One therefore expects that the delivery format and mode of the courses will need to include online (e-learning) modes as well as some face-to-face components according to the need. The face-to-face components can be offered either as formal (paper-based) modules or special workshops. Energy department workers of the Pacific SIDS, for instance, may benefit greatly from online courses which they may be able to integrate into their daily workload and which they could access from their desks. Company CEOs and government officers will probably prefer short (1-5 days) workshops.

Lastly, the possibility of a formal postgraduate course, e.g. 'A Post Graduate Diploma in EASE', perhaps as part of an existing postgraduate Diploma (PGDip) programme (see USP) should also be considered. Such a course may be developed with additional funding support from other sources.

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About the L<sup>3</sup>EAP project:

Lifelong learning for Energy Security, Access and Efficiency in the African and Pacific Small Island Developing States (L<sup>3</sup>EAP) is a three-year project that concentrates on tailor-made learning offers on sustainable energy. The purpose of the project is to increase the capacity of universities in African, Caribbean and Pacific Group of States (ACP) small Island Developing States (SIDS) for the delivery of high-quality lifelong learning courses on the topics of energy access, security and efficiency.

[www.project-l3eap.eu](http://www.project-l3eap.eu)

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