FSEC SWOT ANALYSES

Advisory Board Meeting

March 29, 2019

FSEC Energy Research Center

UNIVERSITY OF CENTRAL FLORIDA

UNIVERSITY OF CENTRAL FLORIDA
COLLEGE OF BUSINESS ADMINISTRATION
EXECUTIVE DEVELOPMENT CENTER

FLORIDA SOLAR ENERGY CENTER®
Creating Energy Independence

Smart SWOT™

Florida Solar Energy Center Mini-Workshop on Strategic Planning Using Smart SWOT

12/12/2014

Dr. B. Porter

To change is to learn; to learn is to change. - Lewis Treen, 1980

FSEC High-Level SWOT Results

FSEC Strengths

- **Existing Capabilities**
  - Strong reputation
  - Technical expertise of faculty
  - Support staff and laboratory facilities
  - UCF support in both R&D and education
  - Adaptability to new opportunities
  - Successful cooperative programs
- **Program Development**
  - DOE is customer and knows capabilities
  - Very strong proposal writing skills
  - Recognized for high quality R&D
  - FSEC brand
- **Education Programs**
  - CED and K-12
  - Public education
  - Train-the-trainer programs

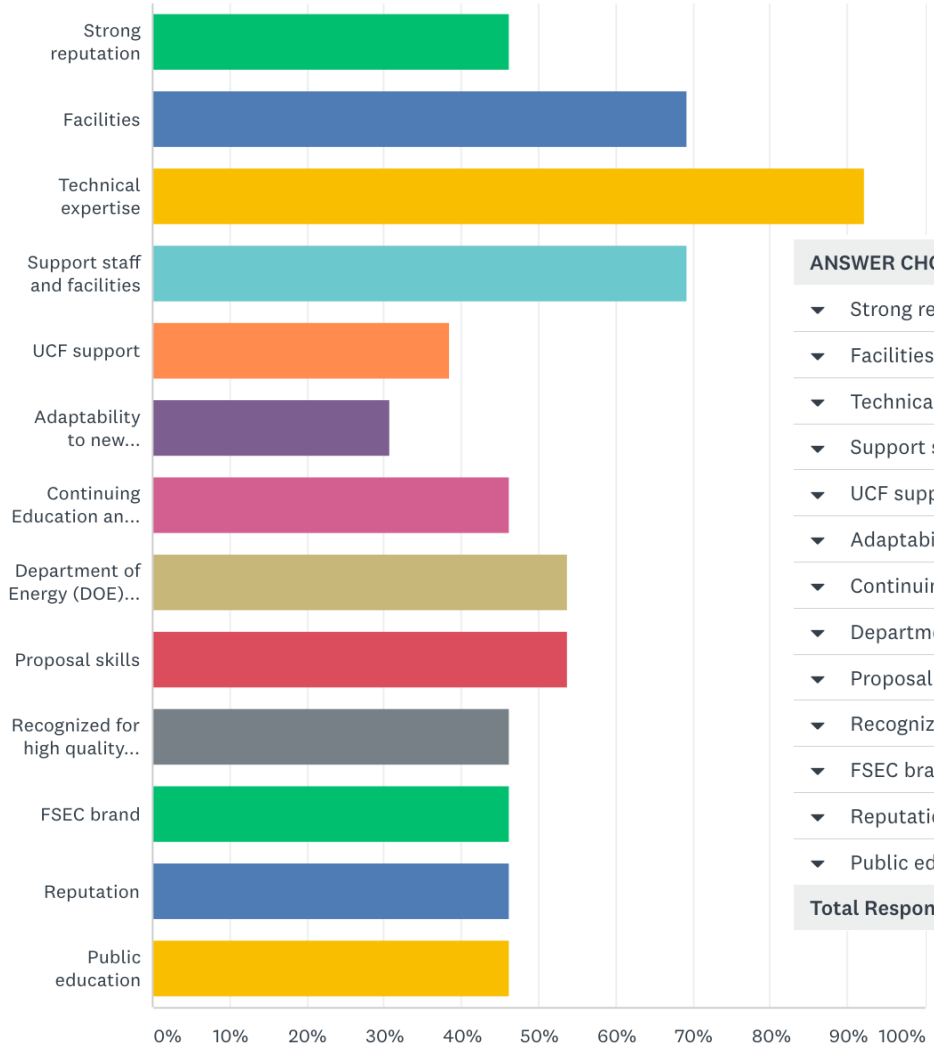
FSEC Weaknesses

- **FUNDING**
- Outreach to other universities
- Focus not always understood by outside entities
- Smart grid development
- Lack of marketing arm
- Interaction with state energy office and private utilities
- Defining a solar commercialization strategy
- EV and smart grid development in FL
- Provide national certification
- Expand Latin American presence
- Provide energy efficiency testing
- Consult to other state agencies
- Aggressive licensing of IP
- Spin-off businesses
- Utility solar usage
- Partnerships with military
- UCF downtown campus

2019 FSEC SWOT ANALYSIS

Advisory Board Members Responses

FSEC Strengths – Advisory Board Member Responses

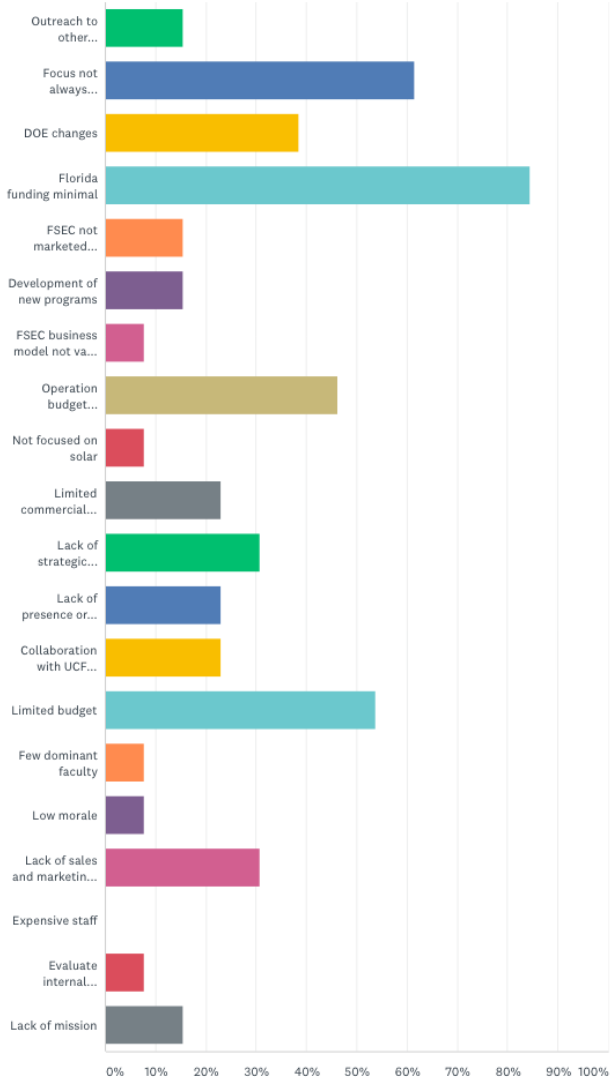


ANSWER CHOICES	RESPONSES	
Strong reputation	46.15%	6
Facilities	69.23%	9
Technical expertise	92.31%	12
Support staff and facilities	69.23%	9
UCF support	38.46%	5
Adaptability to new opportunities	30.77%	4
Continuing Education and K-12 Education	46.15%	6
Department of Energy (DOE) customer	53.85%	7
Proposal skills	53.85%	7
Recognized for high quality R&D	46.15%	6
FSEC brand	46.15%	6
Reputation	46.15%	6
Public education	46.15%	6
Total Respondents: 13		

Strengths Comments

- Affiliation with BPS (Brevard Public Schools)
  Communication with Health First Utilities Director

FSEC Weaknesses - Advisory Board Member Responses

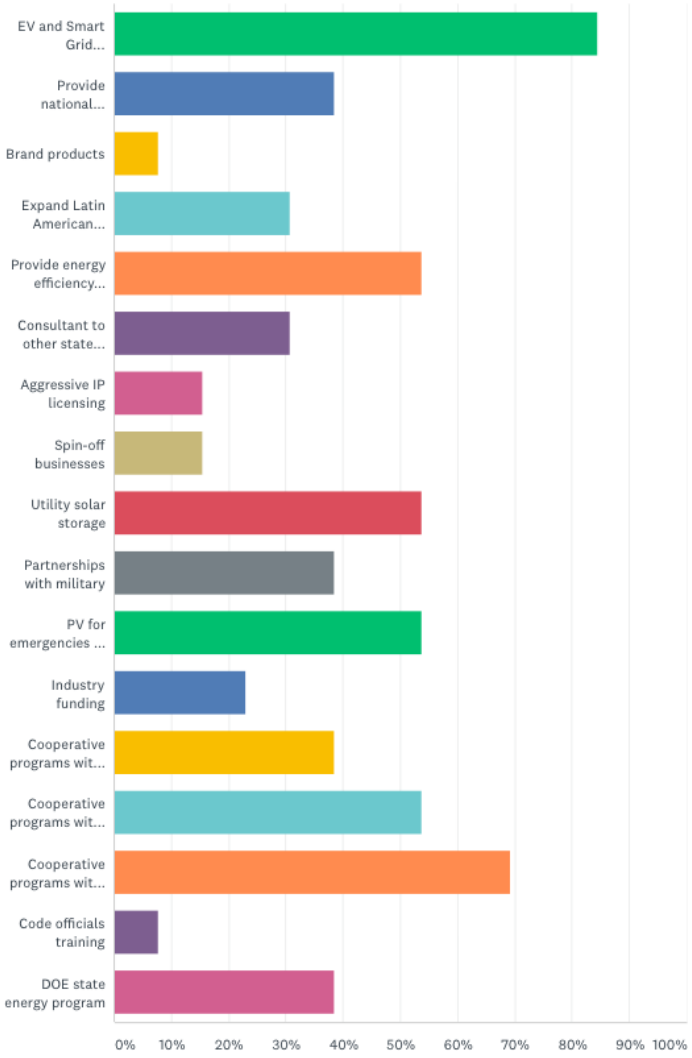


ANSWER CHOICES	RESPONSES	
Outreach to other universities	15.38%	2
Focus not always understood by outside entities	61.54%	8
DOE changes	38.46%	5
Florida funding minimal	84.62%	11
FSEC not marketed properly	15.38%	2
Development of new programs	15.38%	2
FSEC business model not valid in FL	7.69%	1
Operation budget inadequate	46.15%	6
Not focused on solar	7.69%	1
Limited commercial (industry) reputation and participation	23.08%	3
Lack of strategic vision	30.77%	4
Lack of presence or program in Washington, DC	23.08%	3
Collaboration with UCF faculty	23.08%	3
Limited budget	53.85%	7
Few dominant faculty	7.69%	1
Low morale	7.69%	1
Lack of sales and marketing staff	30.77%	4
Expensive staff	0.00%	0
Evaluate internal resources – present/future	7.69%	1
Lack of mission	15.38%	2
Total Respondents: 13		

Weaknesses Comments

- Outreach and offerings to commercial entities could be better.
- Lack of sustainable business model made up of services to the market.

FSEC Opportunities - Advisory Board Member Responses

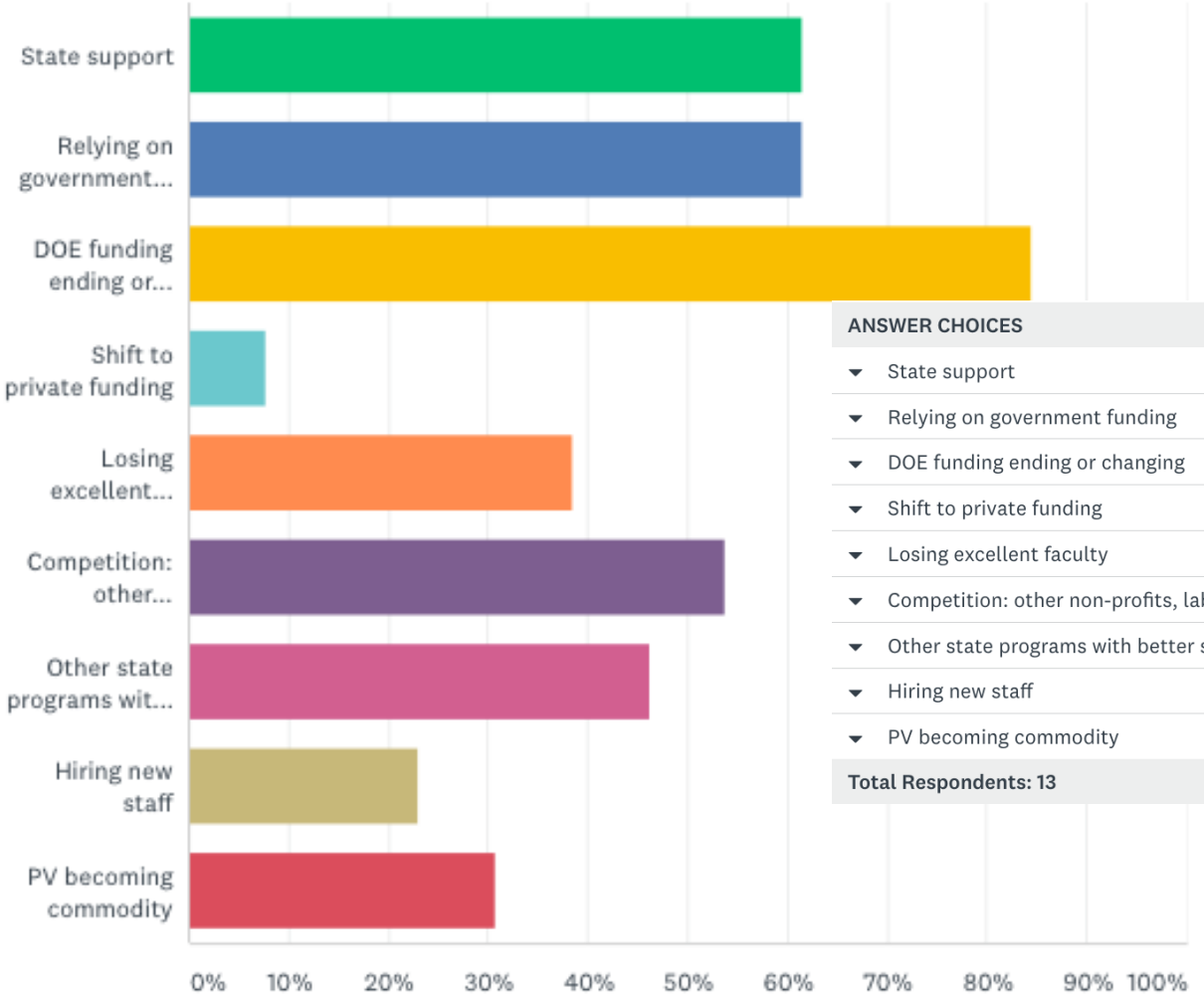


ANSWER CHOICES	RESPONSES	
EV and Smart Grid Development in FL	84.62%	11
Provide national certification	38.46%	5
Brand products	7.69%	1
Expand Latin American presence	30.77%	4
Provide energy efficiency testing	53.85%	7
Consultant to other state agencies	30.77%	4
Aggressive IP licensing	15.38%	2
Spin-off businesses	15.38%	2
Utility solar storage	53.85%	7
Partnerships with military	38.46%	5
PV for emergencies in schools/hospitals	53.85%	7
Industry funding	23.08%	3
Cooperative programs with UCF STEM faculty	38.46%	5
Cooperative programs with UCF Downtown campus	53.85%	7
Cooperative programs with UCF partnerships – energy/business	69.23%	9
Code officials training	7.69%	1
DOE state energy program	38.46%	5
Total Respondents: 13		

Opportunities Comments

- Collaboration with commercial entities on product introductions and grant opportunities
- R&D for distributed energy storage, V2X, Microgrid controls, hydrogen fuel cell, student internship/fellowship program
- Partnerships with City of Orlando and OUC

FSEC Threats - Advisory Board Member Responses



ANSWER CHOICES	RESPONSES	
State support	61.54%	8
Relying on government funding	61.54%	8
DOE funding ending or changing	84.62%	11
Shift to private funding	7.69%	1
Losing excellent faculty	38.46%	5
Competition: other non-profits, labs	53.85%	7
Other state programs with better support	46.15%	6
Hiring new staff	23.08%	3
PV becoming commodity	30.77%	4
Total Respondents: 13		

Threats Comments

- No Comments

Future Challenges to FSEC

- Fossil fuels cost competition Control rather than participating in future solar systems by Energy Corporate Entities
- Connectivity with main campus, growth of grid intelligence expertise
- Being able to adapt with ever changing Solar and Sustainability environment.
- Diversification to expand from solar to other emerging technologies and not be seen as only "Solar" focused. Re-branding may be necessary.
- Completing the shift / branding away from the Florida Solar Energy Center, and just being solar centric.
- Securing more funding from UCF

FSEC Strategic Plan (2019-2024)

- 2014 FSEC SWOT Analysis & Recent Survey
- Two UCF Energy Clusters
- Buildings & Energy Sustainability Working Advisory Team (SWAT)
- UCF Energy Initiative
- Florida's Energy Future (2025, 2030, 2050)
  - Efficiency, Solar, Energy Storage & EVs

With your help and the above background FSEC's Strategic Plan will be crafted

Questions?

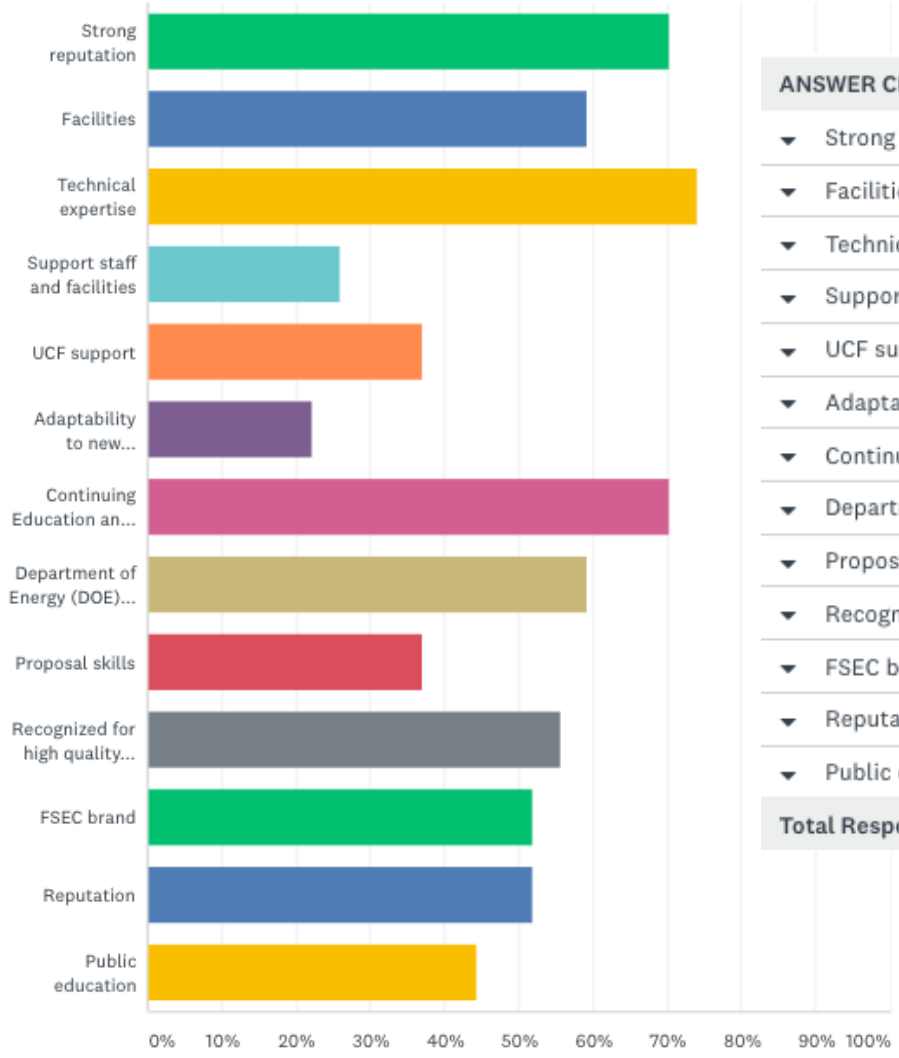
UCF | FSEC Energy Research Center

UNIVERSITY OF CENTRAL FLORIDA

2019 FSEC SWOT ANALYSIS

FSEC Faculty Responses

FSEC Strengths – FSEC Faculty Responses

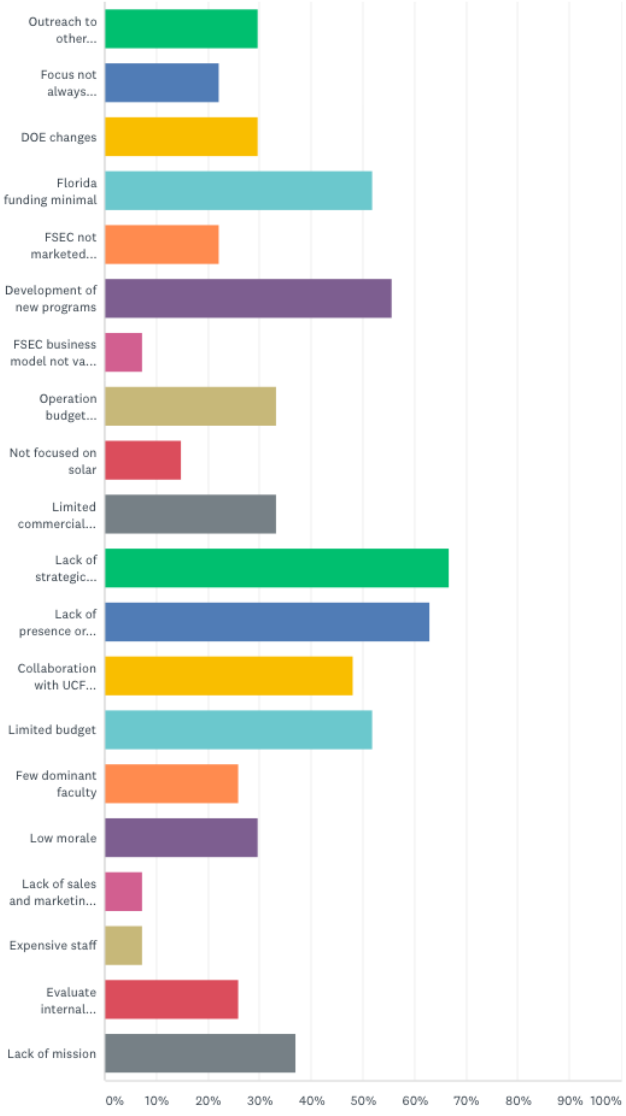


ANSWER CHOICES	RESPONSES	
Strong reputation	70.37%	19
Facilities	59.26%	16
Technical expertise	74.07%	20
Support staff and facilities	25.93%	7
UCF support	37.04%	10
Adaptability to new opportunities	22.22%	6
Continuing Education and K-12 Education	70.37%	19
Department of Energy (DOE) customer	59.26%	16
Proposal skills	37.04%	10
Recognized for high quality R&D	55.56%	15
FSEC brand	51.85%	14
Reputation	51.85%	14
Public education	44.44%	12
Total Respondents: 27		

Strengths Comments

- Research Facilities
- Giving opportunities for Researchers to work here

FSEC Weaknesses – FSEC Faculty Responses



ANSWER CHOICES	RESPONSES	
Outreach to other universities	29.63%	8
Focus not always understood by outside entities	22.22%	6
DOE changes	29.63%	8
Florida funding minimal	51.85%	14
FSEC not marketed properly	22.22%	6
Development of new programs	55.56%	15
FSEC business model not valid in FL	7.41%	2
Operation budget inadequate	33.33%	9
Not focused on solar	14.81%	4
Limited commercial (industry) reputation and participation	33.33%	9
Lack of strategic vision	66.67%	18
Lack of presence or program in Washington, DC	62.96%	17
Collaboration with UCF faculty	48.15%	13
Limited budget	51.85%	14
Few dominant faculty	25.93%	7
Low morale	29.63%	8
Lack of sales and marketing staff	7.41%	2
Expensive staff	7.41%	2
Evaluate internal resources – present/future	25.93%	7
Lack of mission	37.04%	10
Total Respondents: 27		

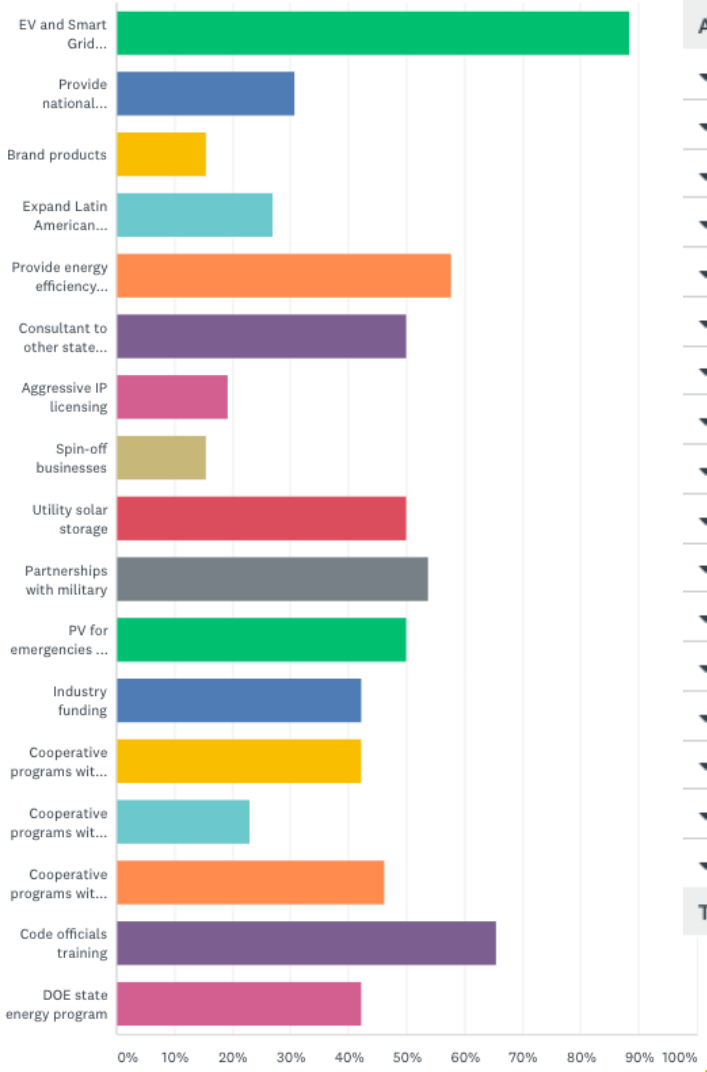
Weaknesses Comments

- Few high level research staff, No one utilizing research facilities
- 1) Loss of younger technical personnel. 2) Loss of field ability through staff attrition. 3) Loss of highest grade newer researchers (PhD level) 4) Loss of support from FL utilities
- Lack of adaptability to create new opportunities
- FSEC heavy reliance on C&G has made it too difficult to retain lower level research assistants that are key to being cost-competitive in proposals. Lack of proposal assistance for large RFP. Difficult on fully engaged PI managing large or multiple projects. Lack of adequate contact development in federal energy research programs outside of DOE.

Weaknesses Comments

- Key sponsor contacts/relationships
- We are weak in electrical storage technology applications; we are weak in commercial building controls and lighting; and despite EVTC we have yet to find a niche for FSEC in the growing move to electrical transportation
- Top heavy staff

FSEC Opportunities - – FSEC Faculty Responses



ANSWER CHOICES	RESPONSES	
EV and Smart Grid Development in FL	88.46%	23
Provide national certification	30.77%	8
Brand products	15.38%	4
Expand Latin American presence	26.92%	7
Provide energy efficiency testing	57.69%	15
Consultant to other state agencies	50.00%	13
Aggressive IP licensing	19.23%	5
Spin-off businesses	15.38%	4
Utility solar storage	50.00%	13
Partnerships with military	53.85%	14
PV for emergencies in schools/hospitals	50.00%	13
Industry funding	42.31%	11
Cooperative programs with UCF STEM faculty	42.31%	11
Cooperative programs with UCF Downtown campus	23.08%	6
Cooperative programs with UCF partnerships – energy/business	46.15%	12
Code officials training	65.38%	17
DOE state energy program	42.31%	11
Total Respondents: 26		

Opportunities Comments

- I only see two options that relate to research directions? We are a research institute and should be identifying new opportunities for cutting edge research.
- Climate related research Consumer education
- Main campus presence/facilities, catalyst for synergistic activities. Access to student researchers. Collaboration with research groups on campus.
- Research for multiple city or state governments; Research for multiple local governments who may be committing to carbon neutral futures and need help planning and implementing.

Opportunities Comments

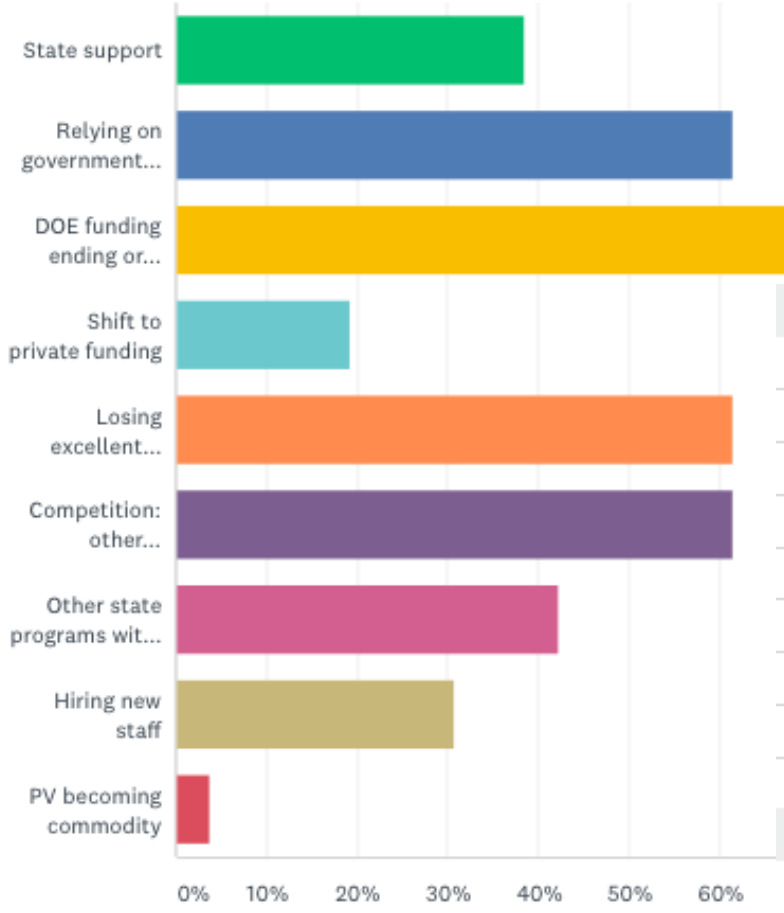
- Keep FSEC's name circulating among all the stakeholders we serve and those we hope will fund us. So they will immediately think FSEC whenever they think energy.

  Public: Video blurbs for general public audience on the website that address FAQ topics whether recorded during a presentation or as a set up in the auditorium. This will showcase the accessibility, depth, and "real world" nature of our research and researchers.

  Funding agencies: Create opportunities for informal interaction such as hosting a hospitality room (with a limited guest list) at conferences, offering program managers the opportunity to say a few words before or after a conference presentation funded by their agency, or including them as advisers on related projects.

  Colleagues (and funding agencies): A webcast interview series, like that show "The Best Thing I Ever Ate" but "The Coolest Energy Thing I Ever Saw" - something to bring out the passion every FSECer brings to the work. Once we finish with everyone at FSEC, we can branch out to other industry leaders.

FSEC Threats - – FSEC Faculty Responses



ANSWER CHOICES	RESPONSES	
State support	38.46%	10
Relying on government funding	61.54%	16
DOE funding ending or changing	84.62%	22
Shift to private funding	19.23%	5
Losing excellent faculty	61.54%	16
Competition: other non-profits, labs	61.54%	16
Other state programs with better support	42.31%	11
Hiring new staff	30.77%	8
PV becoming commodity	3.85%	1
Total Respondents: 26		

Threats Comments

- Competition from other universities
- Competitors have lower overhead. That concerns me. I have to wonder if the University has considered whether this might be pricing us out of the market especially with smaller funding opportunities. It does not appear that FSEC's leadership team spends time developing relationships with funding agencies, such as DOE, by visiting program managers, inviting them to FSEC, and attending agency conferences to meet and mingle with staff. Maybe they are and I just haven't heard about it.

Threats Comments

- Aging staff
- High quality R&D Reputation
- Inadequate maintenance of FSEC existing labs
- Existing staff spread too thin to be flexible or follow new opportunities

Future Challenges to FSEC - 1

- Incorporating our capabilities with UCF
- Need top level faculty with research leadership to charter new areas
- Lack of innovation
- Becoming irrelevant because of a lack of strategic investments in new talent.
- Funding not supported by State allocated budget for renewable and energy efficiency programs. Limited or No funding from electric Utilities
- DOE shifting focus toward controls (residential energy efficiency) and industrial energy use

Future Challenges to FSEC - 2

- Helping implement solar energy and storage/battery schemes into the home with EV's being just another tool in the belt.
- Perhaps we need to ask how does FSEC stay relevant?
- Keeping good people and having adequate funding
- Severe losses to technical staff eventually filter down to impact reputation/ability to compete on proposals
- Commitment by UCF to lead the nation in energy research and education
- Critical mass of capabilities, staff and divisions
- Competition with DOE funding and fostering national lab partnerships.

Future Challenges to FSEC – 3

- Development of new research ideas in residential apart from test/evaluation of new technologies. Gaining more commercial building sector related work will require staff with advanced skills in building energy management systems and other large equipment. Finding work in advanced/alternative energy technologies such as fuel cell, hydrogen. Finding work in energy storage without some expertise on staff.
- Not enough funds to hire new faculty/staff that can help develop new programs. Especially as we continue to lose senior staff to retirement.

Future Challenges to FSEC - 4

- Funding, Funding, and Funding.
- With fewer staff, harder to take on as many diverse opportunities. We need to have research programs that produce some ground-breaking results. Improve our world wide name recognition. Where is the phone app or website that everyone will go to?
- Remaining open with lack of support from UCF

Future Challenges to FSEC - 5

- 1. EV is upcoming and fast emerging market. A research division dedicate to EV can garner support from DOE or upcoming industry to perform some research in EV.

  2. Solar PV installations across globe are growing at 40% annually. This is massive. So research in solar PV with focus on increasing on reliability at cost of less maintenance should be focused. Also, research and development in thin film and Perovskite PV cells to be carried.