Florida Energy Systems Consortium

Website Redesign: Research and Plan

# Project Purpose (Objectives)

The Florida Energy Systems Consortium (FESC) plays a key role in the development of efficient forms of energy generation, distribution and consumption. The consortium pulls the expertise of Florida’s preeminent state universities. The universities are then working towards a shared vision for the State of Florida with minimal duplication of efforts. Since the consortium and its member universities are publicly funded they need make their findings readily available to fulfill their public promise.

While public lectures, new articles and press releases are one way to disseminate information, in internet age there is usually no better way to communicate with the public than a website. Not all websites are created equal, however. A poorly designed website can be difficult to navigate and in turn obscure the intent of the website and the message its authors are trying to convey. A poorly designed website reflects poorly on the authors of the site which can affect public opinion.

Unfortunately, the FESC website (<http://floridaenergy.ufl.edu/>) does not comply with industry best practices for web design. The design issues with the site will be addressed in more detail in the following sections but in summary the site is not accessible to user with disabilities, it does not scale with the size of the display and it is not easy to navigate. It is imperative that the website undergo a significant overhaul to make it available to a wider audience. As it stands individuals that require screen reader assistance cannot interact with significant portions of the site and visitors on mobile devices will have a difficult time interacting with the site.

Therefore, the purpose of this redesign is to first ensure that the FESC website complies with best practices for accessible and mobile design. This will ensure that all Florida tax payers can view the information and research that their tax dollars helped fund. Second, site navigation will be streamlined to facilitate user access and reduce the time spent looking for information. Load times also need to be reduced on the site. Given the content on the site many of the pages load far too slowly and the website or backend server will need to be upgrade to improve response times during site navigation. Finally, a consistent branding is needed for the website to improve site readability.

# State of the Current Site

Before developing a plan to redesign the Florida Energy Systems Consortium (FESC) there is a need to review the current site. In this review any issues with performance, functionality, ease of use, accessibility and mobile design need to be documented. With thorough documentation it is possible to identify areas of improvement.

A key component of modern web design is making sites accessible to individuals with disabilities. This means accommodating screen readers, key board controls, etc… so that individuals with visual impairments or that are unable to use a mouse can interact with the site. In a review of the FESC site the homepage along with two subpages (<http://floridaenergy.ufl.edu/florida-energy-facts/> & <http://floridaenergy.ufl.edu/fl-energy-industry/>) where run through a web accessibility checker (<https://achecker.ca/checker/index.php>). On those three pages the accessibility checker found nearly 200 known problems and almost 700 potential problems that limit accessibility. Most of these problems can be grouped in three areas of web design. The biggest culprit was a lack of contrast in text and background colors that make the site difficult to read for people that are color blind. This can be found in the navigation bars primarily. Next, none of the images on these three pages have alt text attributes. Therefore, screen readers are unable to process this information which in turn means that individuals relying on screen readers do not know that these images are on the page. Finally, images are not clearly separated from the background so it is difficult to tell where an image starts and stops. These were the three most common issues but the sites also had many other accessibility issues.

Another important consideration when designing a website is ensuring that users with mobile devices can easily access and navigate your site. While testing the mobile friendliness of the FESC site the same three pages were tested as in the accessibility tests. Responsive design checker (<http://responsivedesignchecker.com/>) was used to view the three webpages in various client devices ranging from iPhones to desktop monitors. The findings from these tests were that most of the content does not adapt to the display size of the client device. Consequently, to read the body paragraphs of these pages on mobile devices and tablets the user needs to scroll horizontally as they read each line.

Some elements on the page do adjust to changes in display sizes. The header and footer of each page attempt to adjust to smaller displays but this presents two issues. The first is overlap, at a certain point the top nav bar stops attempting to fit into only the display width of the device so on phones users still need to scroll horizontally to find all the links. But at that display width the elements begin to overlap which makes it difficult to access the links. The other issue is formatting, the footer (which contains links to the participating universities adjusts to all display sizes to ensure that each university logo is visible. The problem is that since most of the content on each page does not adapt there is odd white space on the bottom of the page as one scrolls horizontally. The hodge podge of design choices leads to odd formatting that makes the site difficult to use on anything other than devices with widths equal to or greater than the designed width.

In summary the FESC website, or at least these three pages, were not designed with mobile devices in mind. It is very difficult if not impossible to use this website without accessing it on a desktop computer. Unfortunately, this is not where the issues with this site ends. Even if you do not require the missing accessibility features to interact with the site and you are using a desktop computer or another device with a wide enough display to view the site without horizonal scrolling there are numerous functionality issues with the website.

Just on the homepage of FESC there are several links that do not work properly. One of the most prominent elements on the page, the link to download a brochure does not work and instead results in a 404 error message. Also on that page, there is a LinkedIn icon that instead of opening a LinkedIn page only opens the image the logo. There is a similar link to Facebook and another to Twitter that work as expected (the link to Twitter is in page so that should be updated to open in a new tab). Finally, on the homepage there is a textbox to enter an email address to sign up for their newsletter. Unfortunately, there is no clear way to submit your email to FESC and there is certainly no validation that what is entered is a valid address. There are four significant elements on the homepage that are broken. Those were found during a ten minute search it is likely that a more exhaustive search would have found more issues.

The website contains extensive navigation bars to help users get around the site but the way they are laid out on the page is very confusing. It appears that the top navigation bar takes users to key areas of the site and then there is a side navigation bar that allows users to access specific pages within each area. That side navigation bar changes as you toggle through the links on the top navigation bar. From a cursory search it appears that these links work properly. While the functionality is there the execution is lacking. For one as highlighted in the accessibility review there is poor color contrast in both navigation bars which is both visually unappealing and difficult to use for individuals with color blindness. Second in using two separate navigation bars it is not immediately clear what the purpose of each bar is to the user. A single navigation bar with dropdown menus would be far more effective. In general the website uses a wide variety of different layouts and designs which makes the site seem disjointed and difficult to use.

With all of that said the biggest issue is on mobile devices. Users on mobile devices will be largely unable to use the main navigation bar since the labels overlap to a significant degree and are difficult to select. On top of that the content of the site is difficult to read because users are required to scroll horizontally to view all the webpage content. The last issue with the FESC website is performance.

After running the homepage of FESC through Webpage Test (<https://www.webpagetest.org/>) from a client based in Orlando, FL it was clear that significant changes are needed to promote faster response times. The webpage took on average four seconds to fully load. That includes all images, scripts and styling. The biggest issues slowing worsening performance were the images and the YouTube video. The images on the site could be reduce in size significantly to improve load times and there is likely a solution to reduce the impact of the YouTube video on performance. It does not seem that the YouTube video is impacting the visual loading of the page, however. In addition, there are scripts and css files that can be moved to the bottom of the html to cause them to load after the webpage content further improving load times. It also seems that the host server is not able to rapidly transmit webpage information to clients. That is not really an issue that can be fixed through improved web design and is largely out of the scope of this project.

While there is significant work to be done to bring the FESC website up to modern design standards for mobile support, accessibility and performance none of the required changes are difficult to implement. It is possible to setup a project scope to develop a pilot project to demonstrate the benefits of the proposed changes.

# User Research

* Scientists
  + Looking for research papers
  + Peer review and sourcing for papers
  + Different university efforts / collaboration
* Students
  + Research papers
  + Internships?
* Florida Residents
  + Overview of what the group does
  + Quick info
  + How they can get involved
* Policy makers and government officials
  + How the research informs public policy
  + How grant money has been spent

# Device Support

* Mobile and Desktop