Engineers for a Sustainable World

2013 Strategic Plan

Executive Summary

This Strategic Plan is the culmination of 8 months of effort by the ESW-National Team, and represents the end of several years of restructuring for the organization as a whole. ESW was founded in 2002 around international humanitarian and sustainability work, but since 2009 has been emphasizing domestic projects and locally led international efforts. Starting in 2012, a new set of national-level education initiatives, including multi-university courses, and an interest in curriculum reform, have also been added. Finally, the summer of 2013 represents the fourth year of the National Team structure, which has increasingly reconnected chapters into a coherent organizational culture and community. Taken together, these different efforts have led to a revised mission and a joint set of taglines which underlie this strategic plan - Design, Educate, Build, and Projects, Education, Community.

As the end of the restructuring process, this Strategic Plan presents a road map for the next 5 years, in the form of organization-wide targets for growth, new measurements for impact, and a spate of new programs in all areas - organized within four goals targeted at different stakeholder groups. These goals are capped off by something already initiated - becoming an independent organization for the first time in our ten-year history. This large step provides some risks, but will allow more freedom for sponsor relations and new partnerships than we've previously had available. One particular area that independence will help with is in personnel. We've seen the National Team grow from 4 individuals in the fall of 2009 to 15 today, and those extra individuals have allowed ESW-National to provide more regular communication and more programs than in past years. We've also set down a plan for bringing NT members on as paid staff, and re-creating an office of full-time staff - letting us do even more.

We invite you to peruse the document - our history, our present, and - most of all - our future. Let us know your thoughts on what you find, as this is intended to be a living document. And, finally, if some of these ideas - new alumni outreach, multi-chapter projects, sponsors and fundraising, better media awareness, or something else - are something that you can help us with, we'd love to have you become involved, whether as a sponsor, a NT member, a donor, or a volunteer.

Sincerely,

Alexander Dale

Executive Director, ESW-National

July 14th, 2013

Table of Contents

1. Introduction

Engineers for a Sustainable World (ESW) is a non-profit network dedicated to creating solutions to local and global sustainability challenges. Established in 2002, ESW is comprised of students, university faculty, and professionals who believe that engineers are vital in developing and implementing solutions that will allow us meet the global human needs of the present, without compromising those of future generations.

ESW mobilizes students and faculty members through educational programs, sustainability-oriented design projects, and volunteer activities that foster practical and innovative solutions to address the world's most critical challenges.

1.1 ESW Today

ESW is in the process of incorporating in the State of California and acquiring 501(c)(3) status, though it currently maintains fiscal sponsorship under the University of California, Merced (UC Merced). We are an umbrella organization with chapters established at 31 universities in the United States, and one in Canada. Chapters are made up of students and one or more faculty advisors. They are semi-autonomous, selecting their own mix of on campus, local, and international projects. In addition to projects, many chapters host on campus speakers and events to educate their students about current sustainability issues that engineers can help to address. Several chapters have projects that are incorporated into coursework at their universities, usually under the guidance of faculty advisors.

Chapters are coordinated and assisted by a National Team presently consisting of fifteen volunteers. The ESW National Team serves chapters by facilitating communication and collaboration between chapters; creating project opportunities and initiatives in collaboration with companies and sponsors; organizing an annual conference; sending out a monthly newsletter and hosting monthly educational webinars during the academic year; maintaining a website; and recruiting new chapters. An Advisory Board with five members provides guidance to the National Team and student chapters.

1.2 Vision

A world of environmental, social, and economic prosperity created and sustained by local and global collective action.

1.3 Mission

To forge innovative, lasting solutions to local and global sustainability challenges, we:

- Design and implement sustainable projects through our student and professional chapters.
- Educate and train individuals and organizations on sustainable policies and practices.
- Build a global network of communities with a shared culture of sustainability.

1.4 Values

Anyone can join and contribute meaningfully - often in multiple ways.

We recognize the importance of a diversity of skills, backgrounds, and perspectives in addressing complex issues, and actively encourage participation.

Social, environmental, and economic sustainability are all necessary.

A sustainable world has to have a robust ecosystem, a lasting and equitable society, and a stable economy. Though our work often focuses on addressing environmental issues, we recognize these other elements as equally important.

Innovation doesn't always mean new technologies.

Appropriate solutions don't always require innovation, but when they do, that can include both technical innovation and innovative implementation of traditional methods and technologies. We build off of what others have done to avoid reinventing the wheel.

Implementation and education are equally important for long-term change.

Education is important in understanding environmental issues and training future engineers, but implementation of appropriate solutions is also required to ensure a visible, lasting impact.

We collaborate rather than compete.

While competition is an important element of a sustainable economy, we're concerned with solving problems, not with making a profit. We know the challenges we face are beyond the scope of engineers alone to address, and so we seek to share our knowledge and collaborate with others, in order to more effectively develop lasting solutions that work for everyone involved.

It's worth doing the right thing. It's also worth doing things right.

We are ethical and diligent in our work. We develop data-driven solutions to real problems and invest the time and effort to provide quality results,

Sample International Project:

Shipping Container Medical Clinic for Haiti

Chapter: Rensselaer Polytechnic Institute (RPI)

Partner Organizations: General Electric (Schenectady, NY), To Love a Child (Clifton Park, NY), Empire Haiti Coalition (Albany, NY)

Project Description: In 2012 a team of engineering students from Rensselaer retrofitted a used standard shipping container to serve as a medical clinic in Rantlamouaie, Haiti. The student team worked on campus to insulate and ventilate the container, install beds, and install a solar system to provide electricity for lighting, a fan, and outlets for recharging devices. The project was incorporated into a senior engineering design course, allowing students to receive course credit for their design work.

In May of 2012 the container was shipped to Haiti, where a team of ESW students met it to aid in the final construction steps and setup. This year, the team received a $15,000 grant from the EPA's P3 (People, Prosperity, and Planet) program to retrofit another shipping container that will be used as an orphanage and daycare facility in Rantlamouaie.

and then we learn from both failures and successes to drive future improvements.

We are pragmatic optimists.

Pragmatism means seeing the world as it is - in context, with complexity, and often not in very good shape. Optimism is a belief that things can improve. Both are essential for finding effective steps forward.

Suits and stiffness are not requirements for professionalism.

Sometimes we need to laugh. Sometimes short sleeves and sneakers make more sense than suits (say, when building gardens). Our ability to be professionals while making a better world isn't compromised by including students or having fun.

Sample On-Campus/Local Project:

University of Rochester Biodiesel

Chapter: University of Rochester (UR)

Partner Organizations: Dining, Transportation and Facilities Departments at UR

Description: Since 2007, students at UR have been working on a project to convert waste cooking oil from their dining hall into fuel to power a campus bus. Each week, students work in a lab space that they have constructed to produce around 30 gallons of biodiesel using used vegetable oil, methanol, and lye. This project has created many opportunities for students, and has introduced new partnerships and interactions between students, faculty, and University support departments.

Additionally, students are utilizing the group's biodiesel resources to explore other areas of sustainability. For example, one group of students is working to convert the byproduct of biodiesel production, glycerin, into soap to sell in the campus bookstore; and two auxiliary groups research improvements to the conversion process, and perform quality testing on the biodiesel. Students working in the lab or promoting UR biodiesel can earn academic credit through independent studies and coursework.

2.2. ESW Organizational Description

2.1 History

ESW began in 2001 as the unincorporated association Engineers Without Frontiers USA (EWF-USA), under Cornell's Center for Transformative Action. Under the direction of founding Executive Director Regina Clewlow, the organization established its first two collegiate chapters in Spring of 2002, at Cornell and Pennsylvania State University, with four additional chapters forming by the end of the year. In 2004 the organization changed its name to Engineers for a Sustainable World. Ms. Clewlow's tenure as Executive Director ended September 2008, with the Advisory Board appointing Julie Chow as the new Executive Director. Over 2008-2009, the national office was downsized and restructured, largely due to the 2008 recession that removed a key funding source.

In the summer of 2009, after half a year of paring non-core programming and staff, Ms. Chow brought together leaders from several key schools in ESW's network to discuss the future of the organization. The meetings led to a new vision and mission for the organization, moving away from an international development focus to one of developing and empowering student leaders to organize for local projects related to sustainability. This culminated in the fall of 2009 with a permanent shift away from a central national office with several staff members. In its place, ESW began operating with a distributed National Team structure staffed primarily by 5 student volunteers. This shift cut staffing costs, allowed the students who were the primary drivers of the organization to have more of a say in its direction, and allowed ESW to more easily change course. The 2009 reorganization began an increase in the number of domestic projects, with a larger role for on-campus and community projects. Education in the form of for-credit classes, K-12 outreach, and member training also gained prominence as part of national and chapter programming.

The National Team structure successfully sustained and stabilized the organization from 2009-2011, with funding assistance from an anonymous donor and the University of California, Merced. In the summer of 2011, Ms. Chow departed as Executive Director, leaving the head of the Advisory Board, Dr. Dan Hirleman, as the acting Executive Director. This coincided with a relocation of ESW's legal home to UC Merced. The 2012-2013 National Team doubled the number of individual volunteers, enabling a transition from "sustaining and stabilizing" to "growing and improving." ESW underwent a formal organizational redefinition and relaunched with a different niche, a different organizational structure, and a growing set of chapters, members, and programming. The first steps of this redefinition were completed in the summer of 2012, when the Vision and Mission statements for the organization were rewritten to their current status. The final pieces of this process are the completion of this strategic plan and the return to a full-time Executive Director to act as an organizational lead

with a significantly expanded volunteer team. Alexander Dale, one of the initial National Team members in 2009, has been chosen to serve as the Executive Director, taking on the position as of January 1st, 2013, and working full-time starting July 1st, 2013.

Since its formation in 2001, ESW has grown to 31 chapters across the US and one in Canada, with over 1,040 student members, a 15-person National Team, and a 5-person Advisory Board.

Current Chapters

2002	Cornell University
	Northwestern University
	Pennsylvania State University
2003	Stanford University
	University of California, Berkeley
	University of Texas, Austin
2004	California Institute of Technology
2005	Smith College
	Rensselaer Polytechnic Institute
	University of Pittsburgh
2006	Harvey Mudd College
	Iowa State University
	University of Rochester
	University of South Florida
	Rochester Institute of Technology
	SUNY Buffalo
2007	University of St. Thomas
2008	Purdue University
	United States Military Academy
2009	National University of Rwanda
	Midwestern State University
	Washington State University
	University of Texas, Austin (Reactivated)
2010	University of California, San Diego
	Ohio State University
	University of California, Merced
	University of Iowa (Reactivated)
	Smith College (Reactivated)
2011	University of Kentucky, Paducah
	Georgia Institute of Technology
2012	Illinois Institute of Technology
	Kettering University
	University of Rhode Island
	University of British Columbia
	University of Colorado - Colorado Springs

2.2 Summary of SWOT Analysis

ESW's History shows an organization that has shifted directions, structures, and focus several times in its 11-year history. Identifying ESW's future direction and place within the larger sustainability sector requires an analysis of the organization's ability to achieve its overall mission under its current status and external factors. To that end, the Strategic Planning Committee developed a SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis of ESW's overall mission in February of 2013.

Using a standard approach from MindTools, factors that may affect the organization are split into four quadrants based on whether they are internal or external to the organization, and whether they are potentially helpful or harmful. The SWOT analysis identifies key factors to build on, correct, capitalize on, and mitigate, respectively. Three 1.5 hour sessions were used to develop the factors listed below, two with the Strategic Planning Committee, and one with the entire National Team.

Abbreviated Timeline

2001	Engineers without Frontiers (EWF) USA founded at Cornell's Center for Transformative Action
2002	First two university chapters established
2003	First EWF Conference at Cornell
2004	Name changed to Engineers for a Sustainable World
2008	ESW Headquarters moves to Oakland, CA
2009	Restructuring and Formation of the National Team
2010	First ESW Conference under the National Team at Purdue
2011	ESW Moves to UC Merced
2012	First Canadian chapter at the University of British Columbia
2013	Completion of a 5-year Strategic Plan and return of a full-time Executive Director. Incorporation as a separate nonprofit in California, and acquires 501(c)(3) status. Headquarters moves to Pittsburgh, PA

The results show several long-term challenges from throughout ESW's history, such as the challenges of connecting and funding a distributed organization, as well as new external aspects that have appeared in recent years, such as online learning and the recession. However, the strengths and opportunities suggest that ESW is at an excellent position from which to launch a significant effort - though without additional financial and personnel support, that opportunity will be lost.

Strengths - favorable or advantageous characteristics of the organization and/or national team

- Ability to develop and implement solutions to sustainability challenges
- Ability to educate about sustainability challenges & solutions
- Low operational costs due to student volunteer approach
- Passionate student member base
- Easy for people to get involved with a chapter & start projects
- Marketing appeal
  - Appeal of working with & supporting students helps attract mentors & sponsors
  - Appeal of supporting higher STEM education helps attract support
  - Appeal of supporting sustainability initiatives helps attract support
- Broad coverage (nexus of sustainability, engineering, and education) attracts members, chapters, projects, and interest.
- Framework for sharing best practices between chapters and resources among members using National staff
- Network includes many different technical disciplines, which provide expertise
- Project approach:
  - Collaborative and multi-disciplinary
  - Self-directed chapters
  - Leverage local resources

Weaknesses - hindering, unfavorable characteristics of the org and/or NT that put ESW at a disadvantage

- Lack of funding
  - Potential to run into debt or need to shut down critical functions
  - Inability to pay for central office staff
- Inherent problems with the current NT structure:
  - Poor internal communication
  - High turnover in staff and personnel; recruit mostly from engineering student body.
    - Poor expertise
      - Lack of fundraising, business, and marketing skill
    - Lack of continuity in programs and events
      - Webinars are irregular
    - Poor follow-through with chapters and members
      - Weak chapters
      - No monitoring or impact assessment in place
      - Poor contact tracking (alumni, donors, professional members, etc.)
  - Lack a stable geographic and financial location
  - Volunteer-based staff only, with lack of enforcement and lack of engagement at times
- Lack of independent nonprofit status; tied to third party financial controller in UC Merced
  - Bureaucracy slows down financial transactions, especially when delivering on commitments to chapters.
- Few chapters
  - Limited geographic distribution of chapters
  - Few publicity opportunities
  - Lack of presence (including chapter visibility) at major engineering universities

Opportunities - chances, external to the structure of the organization, to make improvements to the overall org/NT performance or impact

- Need for implementation of solutions to sustainability challenges and widespread acceptance of that need & support for solutions.
- Corporate & public interest in sustainability
  - Need for project assistance from community groups interested in sustainability projects, but that do not have the means to hire professional consultants
  - Growing interest in sustainability education but lack of standard coursework in current engineering curricula
  - Large number of potential expansion schools
- Growth of online learning
- Sustained funding for "green" from many local governments (storm water, non-auto transportation, etc.)
- Funding opportunities from many different sources
- Space for a group for technical sustainability professionals, particularly as a hybrid of a prof. org and project-based org.
  - Providing continuing education credits to professionals in sustainability

Threats - elements, external to the organization/NT, which have the potential to cause trouble or impede progress

- University communities
  - Hesitant to double up on similar sustainability organizations (without a clear distinction)
  - Reluctance to fund additional groups
- Threats to expansion to reach critical mass
  - Local political environments may inhibit chapter formation
- Many national sustainability groups competing for similar sources of support and exposure
    - Other groups are more established & have better talent, experience, and recognition
  - Donor hesitation about risks with a weaker organization

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3.3. Moving Forward – Strategies and Goals

ESW's mission is to forge solutions to sustainability challenges. Our primary approach in achieving this is to engage people to learn about, practice, and understand sustainability. To expand our impact on creating a sustainable world, we need to reach more individuals by playing several different roles - whether it's the technical person in the sustainability group, or the sustainability person in the technical group. Looking ahead, we have set targets from July 2013 in 1, 3 and 5 year increments, providing both short-term approaches and a long-term program for expansion and membership growth.

3.1 ESW in Five Years - An Overview

ESW occupies a unique niche at the intersection of engineering, education, and sustainability. Because of our placement on campuses and in communities and our ability to engage both students and professionals in practical efforts that are exemplars of sustainability, we see the organization undergoing substantial growth in the next five years. As we transition away from UC Merced and ESW becomes a fully independent 501(c)(3) organization, we plan to engage a growing number of corporate and non-governmental partners with the organization to help facilitate our expansion and support our members and chapters.

The lifeblood of ESW is its community of members and chapters. Through our direct chapters and partner organizations, which give ESW visibility on many campuses and communities, we see our university involvement growing to 200 campuses within 5 years, with established chapters at 120 schools. This growth will be paralleled at the professional level with the establishment of 40 professional chapters. Through partnerships between local and international universities and NGOs and direct involvement with international universities, we also envision 15 international chapters, or international partnerships, by the end of 5 years.

Through these chapters and activities, we will engage 5,000 students and 3,000 professionals - including 500 faculty, and 200 university Sustainability Coordinators. This larger engagement will result in stronger, more lasting sustainability solutions in more locations.

3.2 Overarching Targets and Metrics

Our overarching path for expanding our impact is straightforward: engage more people with sustainability in more ways. Many of these engagements will be direct, but many will also be through partner organizations. To that end, we establish the following organizational targets, which are supported and enabled by the four specific goals discussed below (Sections 3.3.1-3.3.4).

Table 1: Key Overarching Targets for Membership and Chapters

Group	Current Level	Target by 2018	Notes
Student Members	1050	4000	(Officially registered)
Professional Members	Few	2000	
Faculty Members	40	400	(Part of Professional)
Student Chapters	32	120	
Professional Chapters	1	40	
International Efforts	1	15	(Either chapters, or partnerships with existing international groups)

In addition to engaging more people and groups of people, we must attempt to measure our actual impacts in improving sustainability or reducing damages. Tracking impact categories such as greenhouse gas emissions (e.g. carbon footprints) or particulate emissions will require a more direct connection between local chapter projects and the national organization, as well as a clear framework for calculations. Part of our tactics under Section 3.3.1 focus on the development of tools to track environmental impacts. Another aspect of impacts is the number of people whose lives have been affected by ESW projects but who are not core stakeholders - primarily the communities that we serve, both domestically and internationally. Tracking both number of individuals and any measurable economic savings for these communities will expand impact tracking to the economic and equity aspects of sustainability, as well as the environmental impacts. One key piece of this plan is to establish metrics in all three areas - environmental, economic, and social - assess ESW's current baseline, and set future targets as part of updating this Strategic Plan. Details on these steps are part of the tactics in Section 3.3.4.

We cannot reach targets that we do not effectively track, and so we must include appropriate metrics for these targets and our overall impacts. Good metrics are comparable across different group sizes and through time, will track both people involved and time spent, and are simple for stakeholders to understand. Our basic overarching metrics - tracked regardless of specific strategies or smaller goals - are the six categories listed in Table 1. In addition to tracking these six people-based categories, we will also track chapter activities (local education and projects) and national-level programming (webinars, workshops, etc.). These activity-related metrics help to quantify the engagement side - not just who we are engaging, but how. These metrics also will have contributions from all four of the following goals, although individual goals have specific metrics which are relevant only to their aims.

1. Chapter Activities
    a. Total activities completed

    b. Activities in each category (not exclusive):
        i. Type (Projects, education, etc.)
        ii. Topic tags (energy, food, water, cities, etc.)
        iii. Scale (campus, community, international)
2. National-level Programming
    a. Person-hours of digital content
    b. ESW event attendance
        i. Annual Conference
        ii. Regional Conferences
        iii. Regional Workshops
3. Alumni/Member Positions
    a. Tenured Faculty
    b. Sustainability Directors
    c. Center/Institute Directors
    d. C-suite Positions in Industry
    e. Elected Officials at All Levels
    f. Key Decision Makers in Other Organizations

3.3 Specific Goals

To accomplish the overarching targets described above, we will focus on the following four goals, each of which affects a different set of stakeholders:

1. Empower chapters to enact impactful projects (Stakeholder: Chapters)
2. Educate and train current and future engineers (Stakeholder: Members)
3. Enable groups to share knowledge and create lasting sustainability solutions (Stakeholder: External Partners)
4. Establish ourselves as a key sustainability player in engineering (Stakeholder: All)

3.3.1 Goal 1: Empower chapters to enact impactful projects

1. Description:
   ESW will continue to deliver training, support, and financial resources to our chapters, allowing them to enact high-quality projects locally and globally. Through this support, we will create strong student and professional organizations capable of enacting sustainable change across communities. We will support chapters by developing national project initiatives, educating and training leaders, and facilitating collaboration and communication between chapters. We will facilitate chapter strength through conversations with chapter leaders, sharing of best-practices, and providing opportunities for training and growth of leaders and new chapters.
2. Tactics:
   a. Projects
      i. Train chapter and project leaders to understand the successes and lessons from previous projects to develop new initiatives through their chapter.
      ii. Develop a project impact evaluation program, and report on these impacts on a regular basis to all affected communities and stakeholders
      iii. Create mechanisms for chapters to share best practices to improve positive and reduce negative project life-cycle impacts
      iv. Develop strategies for improvement across chapters founded on best practices
      v. Develop project initiatives and grants focused on implementing:
         1. Unique *single-chapter* projects

2. *Inter-chapter* projects with similar projects at independent chapters
3. *Multi-chapter* projects with several schools collaborating on a single larger effort.

vi. Provide inspiration for new project ideas through sharing prior projects and educating members on sustainability tools and challenges.

vii. Develop cultural sensitivity training protocols and materials for chapters working on international projects

b. Education

i. Build a funded, dedicated staff to provide educational and training opportunities for chapters and chapter leaders.

ii. Build a resource base of best practices to guide chapter and project leaders.

iii. Target training opportunities to chapter and project leaders (see Goal 2).

iv. Train chapters on high-impact practices and opportunities for both chapter growth and development and project success.

v. Train leaders and provide one-on-one advice on best practices in membership retention, project development, garnering university support, and other leadership and chapter relations topics.

c. Community

i. Expand our reach of university chapters, form professional chapters, and expand through sister chapters to nations outside the US and Canada.

ii. Develop a process for helping new chapters seamlessly integrate into the ESW community through resource libraries, connections with strong chapters, and chapter formation and leadership training from ESW staff.

iii. Develop a chapter strength assessment tool and a program for supporting developing or less-developed chapters to transition them to strong players in the ESW Community.

iv. Ensure that our student chapters are trained in cultural sensitivity.

v. Utilize a district-based structure of Chapter Relations to connect leaders more regionally and closely tie chapters to ESW as a whole.

vi. Build a well-funded, well-staffed national organization (see Section 3.3.4), and passionate and dedicated district and regional teams to guide, train, and expand our chapters.

vii. Utilize districts of chapters headed by dedicated District Relations Directors to guide and train chapter leaders and share best practices

viii. Provide support to chapter leaders by creating a professional mentoring program, including facilitating connections to Advisory Board members.

ix. Host chapter leader networking and best practice sharing at International and Regional conferences and provide opportunities for leadership training (See Goal 2).

x. Help chapters develop meaningful relationships with local faculty mentors.

3. Targets:

    a. By June 30, 2014 we will:

        i. Determine district team structure and positions and begin recruiting for these positions.

        ii. Develop a program for helping chapters move from Stage 1 and Stage 2 (developing) to Stage 3 and Stage 4 (Strongly Developed) chapters.

        iii. Have 15% of our chapters reach Stage 4 development.

        iv. Document best practices for recruiting, forming, and integrating new chapters.

        v. Create a system for storing and sharing chapter-created educational content, project knowledge, and materials.

        vi. Create toolkits and starter kits for events and projects from projects and materials that exemplify best practices.

        vii. Develop inter-chapter projects to replace the outgoing Autodesk/ SunEdison initiative.

        viii. Develop a protocol for training chapters that are working internationally

        ix. Identify standard, locally measurable, and feasible metrics encompassing environmental, economic, and social impacts for each type of project or activity.

x. Have chapters work with NT staff to estimate the impact of their projects and events as step to a more thorough evaluation.

xi. Pilot 2 professional chapters.

xii. Publish a detailed annual report with quantitative and qualitative data on the impacts of our projects and organization.

b. By June 30, 2016 we will:

i. Utilize fully developed district and regional teams to develop new chapters and provide resources and support to chapters.

ii. Provide multi-chapter project opportunities for 33% of existing chapters.

iii. Provide inter-chapter opportunities through district teams that reach 25% of chapters.

iv. Have 20% of our chapters reach Stage 4 development

v. Require chapters to annually measure their projects' impacts using previously identified metrics.

vi. Develop tools to allow chapters to teach partners in the community how to measure the impact of their projects.

vii. Provide cultural sensitivity training to all chapters working on international efforts

viii. Develop mechanisms for communities to provide their feedback on ESW projects.

ix. Leverage district teams and alumni network to expand professional chapters across the US.

c. By June 30, 2018 we will:

i. Provide annual multi-chapter project opportunities for over 50% of the ESW Community.

ii. Provide inter-chapter project opportunities that reach 33% of the ESW network through district teams.

iii. Maintain 20% of our chapters at Stage 4 development.

iv. Expand growth of professional chapters to 50 and link professional and university chapters through mentoring programs and joint projects.

v. Create an application-based program for funding innovative single- or multi-chapter projects.

vi. Develop and fund an international project initiative

4. Metrics:
   Measuring chapter growth and strength will be key in assessing and improving National programs targeted at chapters and the quality of communication with chapters. Measuring the proliferation of events, training initiatives, projects, and documentation for best practices will help understand the performance and growth of chapters. We will assess these aspects in terms of both the national efforts to aid chapters, project impact by chapters, the knowledge base created from the university projects, and chapter strength and involvement. Some sample metrics in each of these categories are:
   a. National Efforts - Quality and Quantity
      i. Number of training events provided to chapters
      ii. Number of multi- and inter-chapter initiatives, and number of chapters and members involved in each of those initiatives
      iii. Number of mentorship hours for projects and chapters
      iv. Amount of project funding made available directly to chapters
   b. Project Impacts
      i. Data provided from impact assessments
      ii. Feedback from community members
      iii. Number of people impacted by each project
      iv. Dollars per person impacted
   c. Knowledge Base (See Appendix for 8 categories of sustainability)
      i. Number of unique projects in each of 8 categories of sustainability
      ii. Number of educational programs in each of 8 categories
      iii. Number of articles in each of 8 categories
   d. Chapter Strength & Involvement
      i. Chapters assessed at each level of strength (Stage 1 through Stage 4)
      ii. Number of interactions between chapter leaders through virtual and in-person tools and meetings
      iii. Participation from chapter leaders in training and support program

5. Points of Caution:

   Chapter growth, strength, and project execution are tied to the capacity of the central organization of ESW and the turnover of student leaders on campuses. As has been seen in ESW's history, strong chapters can disappear suddenly with poor continuity of chapter leadership. At the national level, lack of liquidity and diversity of resources can prevent inter-chapter projects from continuing as planned. Succeeding in developing and maintaining strong chapters and multiple project opportunities begins with strength and security at the core of ESW through the National Team, Advisory Board, and Board of Directors. The programs developed for chapter and project leaders must reflect this strength and cultivate it in all aspects of the organization. Furthermore, the educational tools, databases, and assessment measures developed must be easy to understand and use and relevant to chapters for them to be adopted fully and provide value to the organization and all of its stakeholders. Critical thinking and planning will be required for ESW to move toward understanding its organizational impact and pushing chapters and projects to greater success.

3.3.2 Goal 2: Educate and train current and future engineers

1. Description:
   ESW strives to take the lead in training current and future engineers about the principles and practices of sustainable engineering. Through our university and professional chapters, we will educate our members on the science of sustainability and train them in the practical skills needed to design and implement sustainable solutions. We will empower our members to be leaders in the engineering community who understand not just technical skills but also the environmental, economic, social, and political implications of their work. Through continuing education and professional skills development programs, ESW will support the growth and continued learning of our members and the engineering community at large. Through mentoring and networking, ESW will help undergraduate, graduate, and professional engineers develop the skills to create and advocate for sustainable solutions in the education and professional careers.
2. Tactics:
   a. Projects
      i. Provide mentorship opportunities nationally and regionally to connect students with professionals for chapter projects.
      ii. Leverage projects as focal points for skills training, case studies for webinars, and demonstrations for connecting with industry leaders
      iii. Create project development and management toolkits for members to learn how to engage communities and stakeholders in developing new projects
      iv. Offer opportunities regionally, locally, and nationally for members-at-large to get involved in chapter projects
      v. Provide opportunities for individual challenges and competitions that engage members in new skills or topics.
      vi. Train members to consider the final impact of their projects, and to evaluate their project impacts in both quantitative and qualitative terms
   b. Education
      i. Provide skills training webinars to develop leadership and engineering skills beyond traditional engineering disciplines.
      ii. Create and offer training programs through workshops, regional training events, and other formats.

iii. Provide educational webinars on sustainability topics to extend or enhance engineering curricula.

iv. Provide ESW-developed and managed classes on relevant topics in sustainability that allow participants to address various challenges from an engineering perspective.

v. Develop materials and best practices for implementation of K-12 educational programs on specific topics that chapters can use in their own communities.

vi. Integrate political and economic lessons into ESW educational content.

1. Provide educational opportunities that offer Continuing Education Credits and training for existing certification and licensing exams.

c. Community

i. Provide skills training sessions at ESW conferences.

ii. Train members to lead workshops on sustainability topics and skills at their home universities and in their communities.

iii. Create mentoring programs nationally and locally to help:

iv. Professionals educate and inform graduate and undergraduate students about sustainability opportunities in the working world.

v. Graduate students connect with undergraduates on interesting topics and post-graduate opportunities in sustainable engineering

3. Targets:

a. By June 30, 2014, we will:

i. Create database of projects for members (See Goal 1)

ii. Work with current alumni, professional members, and graduate students to establish a mentoring program

iii. Host at least 8 educational webinars during the July-June timeframe.

iv. Host at least 8 skills webinars during the July-June timeframe.

v. Host skills training workshops at the Fall 2013 (regional) and Spring 2014 (organization-wide) conferences.

vi. Develop and pilot one ESW class within existing chapter base

vii. Assess the status of current K-12 programs operated by ESW chapters

viii. Create a resource bank of continuing education credits, training for existing certification, and licensing exams and opportunities at or near ESW campuses

ix. Establish relationships with new non-profit or professional organizations that support member and skills development

x. Assess the educational content of previous conference events and plan for educational development at future conferences

b. By June 30, 2016, we will:

i. Ensure that 80% of current and past projects (active on or after July 1, 2013) are documented in an accessible fashion for members

ii. Create and pilot individual project and competition opportunities for members.

iii. Expand mentoring program to district structure and reach out to additional industry and alumni mentors for involvement

iv. Continue providing monthly webinars on educational content, with 50% being presented in a mixed live presence, virtual presence format similar to TED

v. Provide stand-alone skills training modules on a variety of topics via recordings of old webinars and online support

vi. Launch annual skills training workshops for members and leaders

vii. Develop and implement K-12 programs and educational curriculum modules for members and chapters

viii. Host several webinars every year that are focused on teaching ESW members how to measure the impact of their work.

c. By June 30, 2018, we will:

i. Provide continuous workshop and training sessions with various tracks

ii. Provide programs for continuing education credits and training in sustainability and engineering topics on various topics

iii. Fully implement programs at the National Conference for educational/training seminars, mentor meetings, and community projects

iv. Develop means for chapters hosting speakers and workshops to record, share, and create educational programs from these events.

4. Metrics:
   Training opportunities and ESW's involvement in education are important to measure to ensure that we are targeting our efforts in complementary areas to existing classroom education. Understanding the levels of participation in different forms of training initiatives will also ensure that our efforts are available to the widest possible variety of students and professionals. We will measure the success of our education and training initiatives through tracking project and skills training, involvement in educational events, and participation of members in the ESW community. Some sample metrics in each of these areas are:
   a. Skills Training
      i. Attendance at skills webinars and in-person training events
      ii. Cost per attendee at skills training events
      iii. Number of person-hours of online training modules completed
      iv. Number of Continuing Education Credits awarded
   b. Educational Events
      i. Number of educational events in each of 8 topics of sustainability
      ii. Enrollment in ESW course offerings
      iii. Attendance at webinars, courses, and other educational events
      iv. Cost per attendee at educational events
   c. Community Participation
      i. Number of accesses to project and educational databases
      ii. Number of forum topics and posts
      iii. Participation in individual projects and competitions
      iv. Number of training or mentoring events held per chapter or region
5. Points of Caution:
   The establishment of member training and mentoring relies on good relations with the chapters and their members via strong relationships with the National Team, Board of Directors, and Advisory Board. A strong Outreach Director with connections to industry is needed to help strengthen these connections and mentoring. Connections with alumni will also have to be strengthened as currently ESW does not have good means of staying in touch with alumni.

Finally, the changes in education, skills training, and resources must be relevant to members and current issues. The organization must constantly stay at the forefront of sustainability and keep touch with members' desires.

3.3.3 Goal 3: Enable groups to share knowledge and create lasting sustainability solutions

1. Description:
   We recognize that no single member, chapter, or organization can affect wholesale sustainability change. To amplify our impact, we will reach outside of ESW and outside of our core competencies to engage entities from many disciplines. Direct partnerships will allow for larger diversity in projects, access to expertise in new areas such as public policy for our members, and opportunities to expose more people to technical sustainability. Partnerships will also expand the geographic scope of ESW's presence to an international audience. Finally, as part of engaging with the broader sustainability community, ESW will join existing networks and connect organizations that are not traditionally focused on sustainability to them.
2. Tactics:
   a. Projects
      i. Create national project initiatives around specialty skills (e.g. Life-Cycle Assessment) or broader topics (e.g. engineering and urban planning)
      ii. Help chapters engage local school or community stakeholders for projects (e.g. Facilities Management, community development corporations, etc.)
      iii. Provide support for chapters navigating policy on their local and campus levels for implementing projects (in conjunction with Section 3.3.1)
      iv. Engage partners with other sustainability organizations which focus on economic or political action with whom ESW can provide technical expertise and practical project experience
   b. Education
      i. Develop partnerships with other organizations to bring professional expertise in non-engineering fields to our members and chapters.
      ii. Provide training (as part of Section 3.3.2) on communicating with other disciplines during projects.
      iii. Identify educational outreach opportunities around technical sustainability with partner organizations at the national or local levels.
      iv. Develop a mentor base with K-12 education expertise and experience

c. Community

i. Cultivate national-level partnerships with companies and NGOs providing knowledge support, access to funding and grants, and case studies in other sustainability areas

ii. Partner with other NGOs to expand our understanding of non-technical sustainability efforts and share resources on engineering and sustainability policy.

iii. Provide analysis of proposed and implemented national policy from an ESW perspective to distribute to our community and the general public.

iv. Improve our online networking and social media presence to share ESW activities with other organizations and relevant partner activities with our members

3. Targets:

a. By June 2014 we will:

i. Develop 2 national partnerships that provide case studies and knowledge support for a class of projects

ii. Develop 2 national partnerships that provide operational and capital funding

iii. Be listed as a partner organization with at least 2 national flagship sustainability organizations (e.g. Post-Carbon Institute, AASHE, etc.)

iv. Build a base of mentors from industry partners on a variety of topics related to sustainable engineering, with a ratio between mentors and chapters of 1:2

v. Post on a near-daily basis on ESW's social media outlets.

vi. Develop best practice documents for engaging local community groups in ESW projects

b. By June 2016 we will:

i. Create or partner with a mobile application to assist chapter leaders and members in learning about relevant events and opportunities within and outside of ESW

ii. Increase funding partnerships to 6

iii. Increase knowledge support partnerships to 6 different project classes

iv. Develop political engagement guidance materials and training webinars for chapters through partner organizations

v. Develop 2 additional national-level partnerships with NGOs

vi. Develop a K-12 outreach initiative involving a shared topic and connecting teachers and ESW members

vii. Be an educational outreach partner for a sustainability event

viii. Host a networking meeting at a high-level conference (e.g. AASHE)

ix. Pilot a nation-wide joint initiative with another chapter-based NGO (e.g. TransitionUS)

x. Publish an online archive of essays from ESW affiliates on implementing sustainability through technical students and professionals.

c. By June 2018 we will:

i. Increase funding partnerships to 10

ii. Increase knowledge support partnerships to 12

iii. Establish a regular partnership with a high-level annual event (e.g. EWB with the EPA's NSDE)

iv. Collaborate with other chapter-based NGOs on nation-wide joint initiatives on a regular basis

v. Publish a physical book of best practices, visions, and approaches, compiled from existing and new essays by ESW members and affiliates.

4. Metrics:

To ensure that the partnerships and involvement with the larger sustainability community is meaningful for our organization and members, we plan to track the impact these partnerships have on our chapters and projects. We will assess the ways in which involvement of other organizations has helped provide skills to chapters that were not available solely through ESW, how our members interact with these partners, and how our partners engage ESW as a whole to fill needs in their organization. We will measure impacts from these partnerships for projects, the organization as a whole, and education and training. Some sample metrics for these target areas include:

a. Impacts to Projects

a. Number of documented projects with tags pertaining to outside organizational involvement (i.e., policy, economics, etc.)

b. Number of project collaborations with other organizations
c. Funding opportunities made available to ESW chapters by partner organizations

b. Organizational Involvement
    a. Number of policy reports written or to which ESW has contributed
    b. Number of relationships that engage >5% of our internal member base with:
    c. Political, economic, and/or social organizations and/or individuals at the national level
    d. Local organizations and campus stakeholders at the chapter level
    e. Klout Score increase due to other organizations

c. Participation in Education and Training
    a. Quantity of training materials on skills provided by or taught through partner organizations
    b. Participation of other organizations in training workshops and conference events
    c. Number of advertised webinars, conferences, and events to ESW members by partner organizations

5. Points of Caution:
   While ESW will provide our members with scientific information on the environmental impacts of current policies, we are not a political organization and will not lobby for or against policies or candidates as a national organization. While establishing relationships with other organizations may not be difficult, we recognize that maintaining meaningful, mutually beneficial relationships will be much harder, and will work to make sure that we maintain frequent communication between organizations and members. In addition, there are a finite amount of annual events and key sponsor positions, which will require a strong organization before a long-term commitment can be created.

3.3.4 Goal 4: Establish ourselves as a key sustainability player in engineering

1. Description:
   We will grow and develop to be recognized as an important member of both the sustainability and engineering communities. The quality of our work; the size, diversity, and expertise of our community; and the reach of our impact will define us as an established contributor to global sustainability efforts, and we will work to inform the public and receive recognition for our efforts.
2. Tactics:
   a. Projects
      i. Ensure high-quality projects through effective training programs and strong chapters, in accordance with Goals 1 and 2.
      ii. Increase the scope and impact of our projects through the development of professional chapters and partnerships (Goal 1)
      iii. Increase the number of projects by growing our chapter base, and strengthening and expanding existing chapters in accordance with Goal 1.
      iv. Raise awareness of our projects locally, nationally, and internationally.
      v. Recruit, train, and retain experienced, diverse, and well-educated Chapter Relations and Projects staff.
      vi. Develop funding streams to support nationally-driven high-quality impactful projects.
      vii. Develop baselines for environmental impact.
      viii. Set targets for measuring and improving impact in connection with Goals 1 and 2
   b. Education
      i. Ensure appropriate educational programs become properly accredited.
      ii. Leverage a network of faculty, professional, and nonprofit expertise on sustainability and engineering for educational programs
      iii. Recruit, train, and retain experienced, diverse, and well-educated Education staff.
      iv. Develop baselines for educational impact and program quality
      v. Set targets for measuring and improving organizational impact in connection with Goals 1 and 2.

vi. Revise educational programming to improve quality on an annual basis

vii. Ensure that ESW educational programming is broadcast to interested non-ESW communities.

c. Community

i. Build a diverse community of undergraduate and graduate students, university faculty, and sustainability and engineering professionals

ii. Leverage alumni connections to enhance ESW's visibility and credibility, and create professional chapters in new geographic regions.

iii. Provide opportunities for the community to engage in active work towards our mission and vision through partnerships with external organizations (Goal 3), chapters (Goal 1), projects, and events.

iv. Connect community members to each other through chapters (Goal 1), local, regional, national, and international events, and digital technologies including but not limited to social media, forums, and newsletters.

v. Provide opportunities for community members to continue their education (Goal 2)

vi. Provide opportunities for community members to be recognized through ESW publications and media

vii. Build external awareness of our community through publicity, presence external events, and by expanding it to increase word of mouth

viii. Build a Board of Directors representative of our community

ix. Recruit an Advisory Board with a diverse set of skills and backgrounds, to support chapters, projects, the community, and the national organization.

x. Provide detailed annual summaries of our activities, achievements, and struggles through an annual report.

xi. Develop a diverse and stable fundraising base that is actively engaged in supporting our work.

xii. Develop baselines for social impact

xiii. Set targets for measuring and improving social impact in connection with goals 1 and 2

3. Targets
    a. By June 30, 2014 we will:
        i. Establish a stable internal structure
        ii. Become an independently incorporated organization with 501(c)(3) non-profit status.
        iii. Adopt clear and comprehensive bylaws for organizational decision-making
        iv. Standardize lines of communication between the NT, AB, BoD, Chapters, Partners, and Members, setting conventions for frequency, topics, and primary contacts in both directions.
        v. Have at least 1.5 FTE in paid staff, with an additional 2 FTE in NT volunteer-hours
        vi. Have dedicated funding streams of $100,000/yr
        vii. Improve the aesthetics and usability of the website to increase usage and communication between members
        viii. Have a standard set of metrics for both quality and impact of ESW project and educational initiatives.
        ix. Present annually at two engineering and two sustainability conferences (e.g. ASEE, AASHE, ISSST)
        x. Publish one paper in an appropriate peer-reviewed journal (e.g. IJSLE), in partnership with original chapters as appropriate.
        xi. Have at least 10% of ESW conference registrations come from non-members or new members.
        xii. Have at least 5% of educational programming participants come from non-members or new members
        xiii. Release at least 8 press releases annually to an established press contact list on innovative work done by ESW, either alone or with partners
        xiv. Have ESW chapters or projects featured in news publications at least 20 times.
    b. By June 30, 2016, we will:
        i. Have at least 4 FTE in paid staff, with an additional 3 FTE in NT volunteer time (8-16 volunteers at 5-10 hours/wk)
        ii. Develop at least 3 district teams of 1.5 FTE each around key chapter concentrations

iii. Have dedicated funding streams of $300,000/yr

iv. Present annually at three engineering and three sustainability conferences (e.g. ASEE, AASHE, ISSST)

v. Publish two papers annually in an appropriate peer-reviewed journal (e.g. IJSLE), in partnership with original chapters as appropriate.

vi. Have at least 33% of ESW conference registrations come from non-members or new members.

vii. Have at least 10% of educational programming participants come from non-members or new members

viii. Be a primary organizational partner for an external national competition or event.

ix. Release at least 18 press releases annually to an established press contact list on innovative work done by ESW, either alone or with partners.

x. Have ESW chapters or projects featured in news publications at least 30 times.

c. By June 30, 2018, we will:

i. Have at least 8 FTE in paid staff, with an additional 5 FTE in NT volunteer time (this is 16-32 volunteers at 5-10 hrs/wk)

ii. Have district teams of 2 FTE present in 6 geographic regions

iii. Have dedicated funding streams of $750,000/yr

iv. Present annually at four technical and four sustainability conferences (e.g. ASEE, AASHE, ISSST)

v. Organize the sustainability section of a larger technical conference on an annual basis.

vi. Publish three papers annually in an appropriate peer-reviewed journal (e.g. IJSLE), in partnership with original chapters as appropriate.

vii. Have at least 20% of educational programming participants come from non-members or new members

viii. Release at least 24 press releases annually to an established press contact list on innovative work done by ESW, either alone or with partners.

ix. Have at least 40% of ESW conference registrations come from non-members or new members.

x. Have ESW chapters or projects featured in news publications at least 40 times.

4. Metrics:
   Good indicators of our growth and establishment in the engineering, sustainability, and education communities will assess the reach of our organization across various stakeholder groups in these communities. We will look at the presence of ESW in social and external media, the growth of the organization in terms of members and chapters, and the acknowledgment of ESW by partner organizations and potential donors. Furthermore, we will track internal stability to ensure that we maintain and improve the capacity of the organization to support our chapters and members effectively. We will track indicators in the categories of External Presence, Internal Stability, and Organizational Growth. Some sample indicators in each of these categories are:
   a. External Presence
      i. Diversity of funding sources and fundraising opportunities (companies, alums, one time donors on website, etc)
      ii. Number of external media impressions of ESW National or chapters
      iii. Number of invitations to conferences and events hosted by partners.
      iv. Number of papers and presentations at external conferences and events
   b. Internal Stability
      i. Vacancy time of Advisory Board, Board of Directors, and Staff Positions
      ii. Number of District Staff
      iii. Number of applications for Advisory Board, Board of Directors, Staff, and Volunteer Positions
   c. Organizational Growth
      i. Number of new chapter requests annually
      ii. Number of new members (professional and student by chapter and at-large)
      iii. Annual increase in incorporated chapters (professional and student)
5. Points of Caution:
   Increasing our presence and stature in the engineering community is heavily reliant on maintaining a consistent external presence. To achieve this, we need

engaging and strong communications and marketing, which are currently under-supported areas of our National Team. Furthermore, we need to be actively developing and fostering relationships at events both hosted by ESW and by other groups. Finally, to develop strong programs that are worthy of recognition, we need strong, capable internal staff. This may require growing the National Team and developing in specific areas to help position ESW as a leader in sustainable engineering education and project development.

A second point of caution is that while the number of sustainability-related problems is functionally unlimited, the pool of available resources to support organizations - particularly operational funding - is finite. While ESW is in a much stronger niche now than in its history, it faces competition for recognition from other groups in several focus areas. Partnerships with organizations in these areas will be important to transform competition into collaboration where possible, as well as the successful implementation of high-profile, organization-defining initiatives.

Finally, we must be careful to grow at a pace that allows our national team to continue to support, and provide resources to, our chapters and members. By growing too quickly without the support structure in place, we will not be able to monitor our members, or ensure that our projects are creating the best possible impact for everyone involved.

Funding Streams and Staff Targets

ESW's funding currently comes primarily from dues paid from chapters and members. Going forward, key goals involve re-establishing sponsorship and donations as revenue streams, and adding additional funding from governmental or private grants. The primary costs are threefold: staff salaries, project funding, and overhead (travel, offices, and digital services). Travel is critical for NT members and some conference attendees, but most overhead demands are accomplishable with relatively low funding (<$20k). Project funding is in demand from chapters (sustainability requires capital investments), but fundamentally not critical to many core operations - additional funding allows additional opportunities, but a lack of funding does not necessarily cripple the organization. The limit on spendable program funding is based on the number of engaged chapters and the types of projects that they are engaged in. Finally, staff salaries represent large annual costs that are never-the-less critical for long-term organizational sustainability, as without central full-time staff, ESW cannot thrive.

Moving forward, we have set targets for annual incoming revenues of $100k in 2014, $300k in 2016, and $750k in 2018. These are ambitious targets given our current income of ~$10k/yr, but allow for a central office to be re-established and NT members to begin to be paid for their time investments. The path forward for staff hiring is as shown at right, assuming incorporation as an independent organization by the end of the summer of 2013.

Timeframe	Position	FTE	Est. Cost
Summer, 2014	Executive Director	1	$50k
	Administrative Assistant	0.5	$15k
	Total	**1.5**	**$65k**
Summer, 2016	Executive Director	1	$60k
	Administrative Assistant	1	$30k
	Financial Manager	0.5	$25k
	Technology Manager	0.25	$7.5k
	Education Director	0.25	$7.5k
	Projects Director	0.25	$7.5k
	Development Director	0.25	$7.5k
	Chapter Relations Director	0.25	$7.5k
	Communications Director	0.25	$7.5k
	Total	**4.0**	**$160k**
Summer, 2018	Executive Director	1	$80k
	Administrative Assistant	1	$30k
	Development Director	1	$50k
	Education Director	1	$50k
	Projects Director	1	$50k
	Chapter Relations Director	1	$50k
	Communications Director	1	$50k
	Financial Manager	0.5	$25k
	Technology Manager	0.5	$15k
	Total	**8.0**	**$400k**

4. Updates To and Review of This Strategic Plan

4.1 Annual Planning Procedure Using This Document

We will use this document as a guide for the next five years of work, both in planning new efforts and reporting on ongoing progress. For planning new efforts, an annual

process will create each year's development plan, which is intended to be a specific set of tasks for implementation, as opposed to the general goals contained in this plan. The first step will be a review of intended programming, identifying three groups: efforts that will be expanded for the next year, efforts that will be publicly launched in the next year, and efforts that will be internally developed or piloted in the next year. The contents of each group will be used to assess additional resources that will be required, whether personnel, physical infrastructure, technological, or financial. Additional webinars may require technological resources, better project quality control will require personnel, and a dedicated workshop space will require both physical and financial resources. Acquiring these resources either directly or through partnerships will become the goals of the development plan. The development plan will be prepared for internal use and will not be subject to the same external review as this strategic plan.

This plan will also form the basis for the metrics in our publicly released annual reports. These will detail our progress towards our overall people-related targets, organizational metrics, and goal-specific metrics. In addition, it will feature highlights of our previous year's programming around pilot, launched, or expanded programs. With some input from the development plan, the annual report will serve to both track the metrics detailed in this report, and inform our stakeholders of our future plans. The annual report will be released in the first week of October of every year, and will be publicly available.

4.2 Protocols for Reviewing, Updating, and Supplementing This Document

This strategic plan includes all of the programs and expansion we foresee happening through 2018. In practice, events will happen and opportunities will appear, and while we have structured this document at points to be open-ended as to specifics (e.g. partnerships), there may well be unforeseen chances to increase our impacts. Current and future leaders should not feel restricted from taking advantage of those chances, and this document can be updated with the following procedure.

Concurrent with the creation of each year's development plan, the committee in charge of creating that plan will suggest additions and updates to specific goals as they see fit. These changes must be in line with the mission and vision of ESW, and fill an available niche unmet by current or planned efforts, or show that changes in ESW's organizational space have made future programs unnecessary as written. Changes, such as new program development, new organizational partnership goals, or the elimination of certain programs (perhaps participating in a partnership instead), must be written up in the same manner as the goals in this document. These proposed changes will be made available to ESW's leadership and membership for a comment period, which will last a minimum of one month. Comments will be addressed by the committee, and the revised proposals will be included in the strategic plan with the vote of two-thirds of the Board of Directors. The comments and responses will be attached in the Appendices.

5. Appendices

ESW's Definition of Sustainability

Sustainability as a term has risen to prominence, but is often poorly defined. It is also the result of recent marketing over-usage, further requiring explicit definition. The 1987 UN Brundtland Report defined sustainable development, but that definition lacks applicable specificity. Within ESW, sustainability is generally defined as "Resource usage at or below the natural rate of regeneration,"[2] a definition based very much on physical processes, which are the focus of many ESW programs. This definition applies equally well to resources such as biomass as to natural buffering capacity – climate change is the result of releasing greenhouse gases (GHGs) faster than natural systems can absorb them.

Because we do not live in a sustainable world, it is also worthwhile to define a path towards one. Such a path could be reasonably referred to as sustainable development, and is defined here as "Decreasing the rate of use of unsustainably procured resources at such a rate that sustainability is reached before the resource is exhausted."[1] This definition implies, appropriately, that resources such as natural gas can be part of sustainable development as long as society is focused on reducing total use of them, subject to other constraints such as total GHG emissions. These definitions are difficult to extend to societal aspects such as inequality that are nevertheless part of a more complete definition of sustainability – for an example, see The Natural Step framework [3], which defines a sustainable world as one where "Individuals are not subject to conditions which undermine their ability to meet their basic needs".

Beyond a definition, education on sustainability and sustainable development must encompass a broad set of topics. With the same bias towards physical systems, ESW monitors educational efforts within 8 major categories: Energy, Water, Food, Climate Change, Resources, Cities, Ecosystems, and Economy. These categories are intentionally highly connected, and lead to discussion on a huge range of problems, issues, and projects.

[1] Dale, A. The Sustainable Water-Energy Nexus: Impacts and Feasibility of Regional Energy & Water Supply Scenarios. University of Pittsburgh Doctoral Thesis, Pittsburgh, PA, 2013.

[2] "Heinberg, R. What is Sustainability? The Post-Carbon Reader, Healdsburg, CA: Watershed Media, 2010

[3] "The Natural Step: Four System Conditions, available online at http://www.naturalstep.org/the-system-conditions"

Community Outreach

Here we catalog the comments we received on the Strategic Plan and the responses from the ESW Strategic Planning Committee. A draft of the plan was put out for

comments in January 2013, and the comment period was closed in May 2013. All ESW members, leaders, volunteers, and advisors were invited to participate in the comment and response process.

Comment: Does ESW really want to push for international projects? Engineers Without Borders already exists and is a very strong organization. If ESW is to truly prosper, its niche should not overlap with another similar org's. I also have strong feelings about young undergraduates going into developing nations to do projects that they are not culturally equipped or even technically able to handle.

Submitted By: Brittany Bennett, ESW Smith Chapter President

Response: I think we have similar feelings on international projects. Our vision for ESW in an international setting is (a) we have chapters that will continue to do international projects as part of their autonomy or legacy but that (b) new international activity should be based around chapters of individuals or partner organizations in a country rather than students going to places with any sort of a 'savior' mentality. We've been working since 2009 to emphasize domestic projects as our primary target, and we anticipate 90% of our national initiatives being domestic.

Comment: I believe ESW needs to define "sustainability" in the Strategic Plan.

Submitted By: Brittany Bennett, ESW Smith Chapter President

Response: This definition has been included in the final version as an Appendix and is available on our website.

Comment: Incorporating in CA, but moving HQ to Pitt. Why?

Submitted By: Nayeli Gallardo, ESW Stanford Chapter President

Response: The incoming Ex. Dir. is based in Pittsburgh, and it is closer to the majority of our chapter base. At the same time, our long-term ideal location would be in California.

Comment: Target to engage other NGOs. Great idea, any plans?

Submitted By: Nayeli Gallardo, ESW Stanford Chapter President

Response: We do not have specific plans yet, but will be developing them with the incoming NT recruits during the June and July timeframes.

Comment: Project Impact Evaluation form is a great idea, online & streamlined is best. It would be awesome if we could store it on the National website, and have other chapters & NT have access to it. Make it a simple form that’s easy to access.

Submitted By: Nayeli Gallardo, ESW Stanford Chapter President

Response: Thank you - we will work on building out that technology.

Comment: Liked education part. For the education part, Stanford has been trying to shift towards a service-learning focused curriculum, and the Public Service center has been really helpful for Stanford, maybe NT could take advantage.

Submitted By: Nayeli Gallardo, ESW Stanford Chapter President

Response: Thank you - we will add them to our list of organizational resources.

Comment: Liked cultural sensitivity - both internationally & domestically

Submitted By: Nayeli Gallardo, ESW Stanford Chapter President

Response: Added target for training

Comment: K-12 educational support will be very helpful - Stanford is just getting started there. Have 5 people working on developing that for a specific project, but that would be a useful area to have support materials.

Submitted By: Nayeli Gallardo, ESW Stanford Chapter President

Response: Noted - we will actively attempt to engage k-12 expertise in mentors.

Comment: Errors on page 7 in project description

Submitted By: Nayeli Gallardo, ESW Stanford Chapter President

Response: Several grammatical errors have been corrected

Comment: International chapters - goal is 15? Specific targets? Stanford has a lot of international students, could potentially help with that.

Submitted By: Nayeli Gallardo, ESW Stanford Chapter President

Response: Rephrase to 15 groups working with ESW - chapters or NGOs.

Comment: Metrics for success are great to have, especially for seeing where attention needs to be paid and where not. Information-gathering needs to be something that NT does, not chapters - chapter leaders have plenty of work already. Not going to want to or remember to send detail of X event Y people Z categories. Maybe can be streamlined, but particularly right now when chapter leaders aren't really connected to nationals (chapters are chapters problem, nationals is nationals problem), not going to think

about recording metrics and sending them to NT. Responsibility of NT to reach out to chapter leaders, have data entry (nitty-gritty) be responsibility of NT. Nobody likes too many meetings (e.g. weekly or biweekly) but monthly or so could be feasible. 1 on 1 w/ chapter leaders and asking in person could work fine - contain administrative & small interactions between NT and chapter within designated time.

Submitted By: Brian Lange, ESW Northwestern Chapter President

Response: We will examine better ways to collect chapter information between NT and chapter leader responsibilities. In consultation with leaders, we will find a method for meeting the needs of ESW National and the constraints of chapters.

Comment: Leadership development - don't want to go overboard, has diminishing returns v. experience, but is definitely critical especially for new chapters, new leaders, keeping chapters alive

Submitted By: Brian Lange, ESW Northwestern Chapter President

Response: We will look to include development materials for larger and well-established chapters as well as newer chapters and leaders to provide value to both types.

Comment: Your core identity, established by the name of the group, makes it seem like engineering is a core part of your mission, but engineers and/or engineering are not mentioned in the mission at all. There seems to be some conflict there that is a bit confusing.

Submitted By: Kristin Hansen, ESW Advisory Board Member, Sustainability Coordinator, UC San Diego

Response: While our core community is engineers, the issues we focus on are not just engineering problems, and our mission is focused on sustainability, not just engineering. Additionally the title of our organization implies that engineering is a part of our core identity, and we felt we did not need to continually repeat this. Including some specificity about the technical background of our core community is something we will discuss at this summer's NT retreat.