



White Papers Submitted to the Technology Innovation Program

The Technology Innovation Program (TIP) at the National Institute of Standards and Technology was established to assist U.S. businesses and institutions of higher education or other organizations, such as national laboratories and nonprofit research institutions, to support, promote, and accelerate innovation in the U.S. through high-risk, high-reward research in areas of critical national need. These areas need government attention because the magnitude of the problem is large and societal challenges are not being sufficiently addressed.

To help select areas of critical national need that shape funding opportunities, TIP askedⁱ interested parties to submit white papers describing an area of critical national need and how those needs might be addressed through potential technological developments that fit the TIP profile of high-risk, high-reward R&D. White papers could discuss any area of critical national need of interest to the submitter or could address any of the following topic areas: civil infrastructure, complex networks and complex systems, energy, ensuring future water supply, healthcare, manufacturing, nanomaterials/ nanotechnology, and sustainability. These white papers—along with input from NIST, the TIP Advisory Board, other government agencies, the technical communities, and other stakeholders—have been incorporated into the TIP competition planning process.

This analysis provides some insight into the range of input TIP received through the white paper process. This analysis looks at the organizations that sent in the first 275 white papers, the states in which those organizations reside, and the general topics discussed in these white papers. The white papers were received between September 1, 2008,ⁱⁱ and March 1, 2011.

Figure 1 shows the breakdown of the 590 authors and contributors of the first 275 white papers.

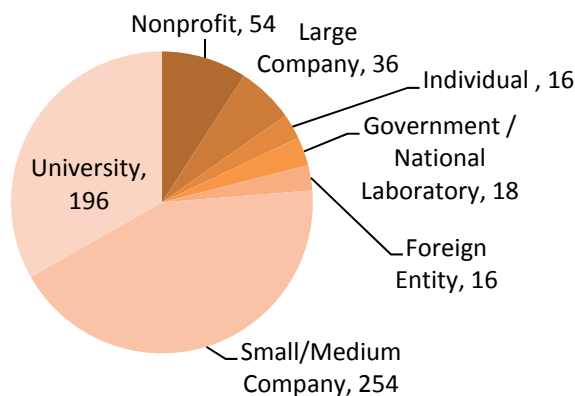


Figure 1: White Paper Authors and Contributors

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Authors and contributors in the individual category provided no affiliation. Authors and contributors from government entities included Federal Government entities (eight), national laboratories (seven), and local government entities (three). The 16 foreign authors and contributors included foreign-located companies (four), foreign nonprofits (two), foreign universities (six), and a foreign national or government laboratory (four).

Figure 2 shows the breakdown of the 552 authors and contributors who were affiliated with 352 different entities. A number of individuals collaborated on or contributed to the different white papers submitted by several entities, especially universities.

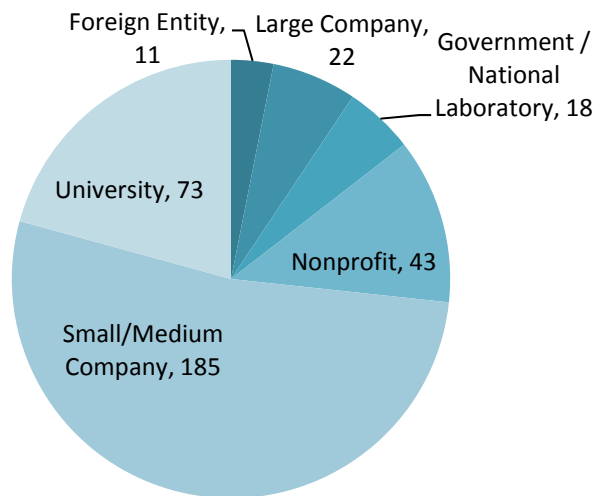


Figure 2: Affiliations of White Paper Authors and Contributors

Because the paper authors were not asked to classify the entities by type, papers were classified by checking company Web sites for size information and verifying whether an entity was foreign.

On average, white papers had 2.1 authors. Authorship information follows:

- 166 (or 60 percent) white papers had a single author
- 109 (or 40 percent) white papers had multiple authors or contributors
- 73 (or 27 percent) white papers involved multiple organizations

The 73 white papers involved multiple organizations, as follows:

- 38 involved 2 organizations
- 17 involved 3 organizations
- 13 involved between 4 and 9 organizations
- 5 involved 10 or more organizations

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Of the 352 organizations that contributed to white papers, 11 were foreign entities. The remaining 341 plus the 16 individual authors came from 43 different states and the District of Columbia. Figure 3 shows a breakdown of the states and the number of white papers, including authors and contributors from each state.

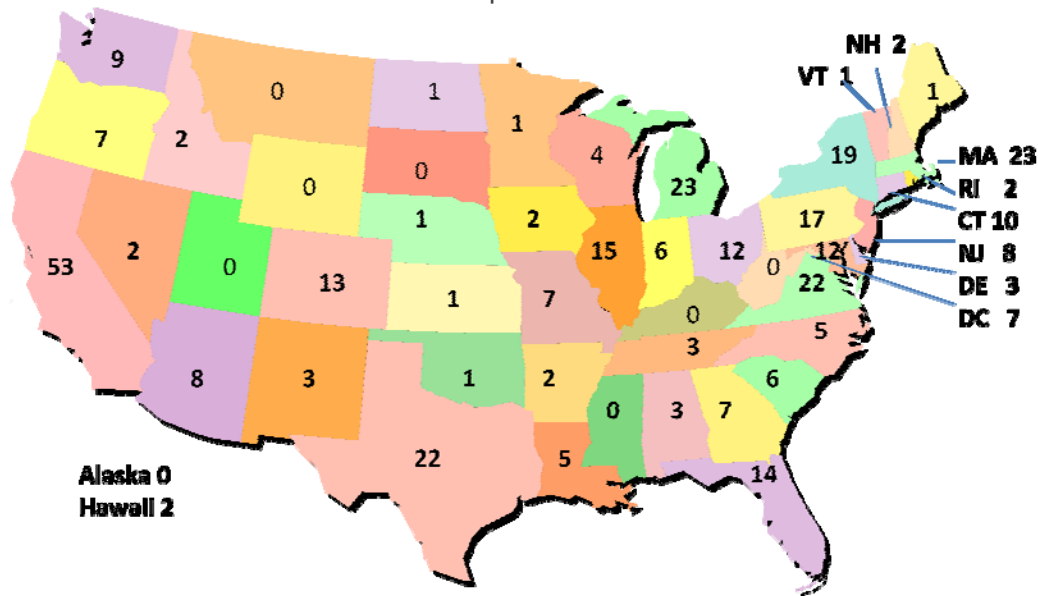


Figure 3: White Papers Authors and Contributors by State

About 79 percent of the white papers (219) included authors or contributors only from one state. Fifty white papers included authors or contributors from multiple states. Five white papers had only authors from foreign institutions or individual inventors who did not identify their home states.

Looking at common configurations of organizations that submitted joint white papers, 22 white papers included at least two small or medium-sized for-profit companies as authors or contributors, and 27 white papers included at least one small or medium-size for-profit company and at least one institution of higher education as an author or contributor. Overall, 47 white papers had a combination of entities that could form an eligible joint venture in a TIP proposal, thus illustrating a promising mix of organizations that could form eligible joint ventures.

The white papers were frequently cross-disciplinary. Figure 4 categorizes the white papers by the major topic areas discussed.

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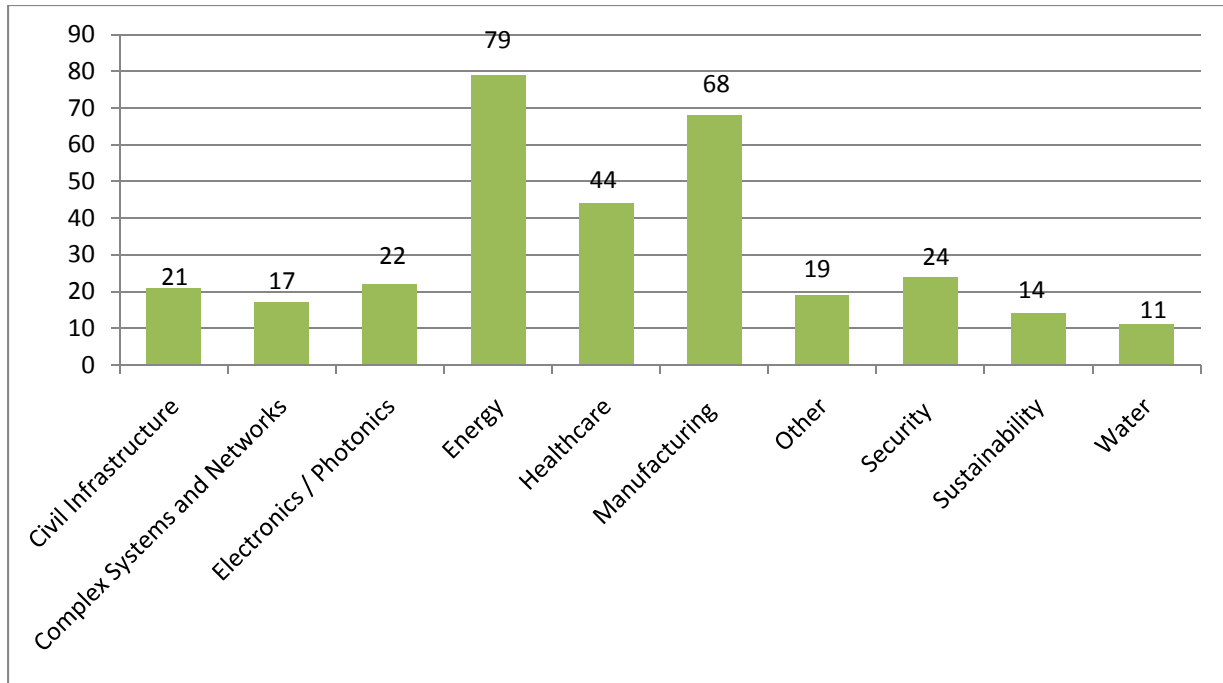


Figure 4: White Paper Technology Areas

The manufacturing topic area included materials topics and sustainable manufacturing. The healthcare topic area included personalized medicine and biotechnology. The security topic area included disaster recovery, cyber security, and voting systems. The miscellaneous category included aircraft (three), social science topics (three), education (four), agriculture (one), aquaculture (two), and software development (five).

Following are conclusions from the white paper solicitation process:

- The white paper process is reaching a large, diverse community of researchers in the United States. This diversity includes both a broad geographic reach and a wide mix of organizations submitting ideas.
- Collaboration is happening in the development of white papers. This collaboration is internal to organizations and external with different organizations.
- Collaborations that appear promising for future joint ventures are starting even at the white paper stage. White paper collaborations demonstrate the willingness of companies to work with each other and with universities and other entities.
- Authors invested substantial effort in putting together many of these white papers, demonstrating a significant commitment to the ideas discussed in the white papers.

ⁱ *Federal Register*, 73, no. 242, Tuesday, December 16, 2008, p. 76339.

ⁱⁱ TIP received a few unsolicited white papers before the official call for white papers. All white papers received are grouped together for analysis.

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