Statement of

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Trailblazers and Lost Einsteins: Women Inventors and the Future of American Innovation

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Chairman Tillis, Ranking Member Coons and Distinguished Members of the Judiciary Committee's IP Subcommittee, thank you for the opportunity to testify before the subcommittee today on the topic of *"Women Inventors and the Future of American Innovation*." By way of introduction, I am an Assistant Chief Intellectual Property Counsel of 3M Company, based in St. Paul, Minnesota. I also co-lead the Women Inventors Committee of the Intellectual Property Owners Association (IPO), a trade organization for IP owners with over 175 corporate members. I am also an inventor, with 6 issued U.S. design patents.

The Gender Disparity in Patenting

The United States Patent and Trademark Office's recently issued *Progress and Potential Report* finds that, in 2016, fewer than 12% of all patent inventors were women[1]. The Institute for Women's Policy Research predicts that, without a concerted effort to change course, it will take until the end of this century to reach gender parity in innovation[2]. That literally means that it will take another lifetime to achieve innovative gender parity.

Why does this matter? In many technical fields, patents are linked to promotion and salary increases, so gender disparity in patent filings and issuances can correlate to gender disparity in advancement and salary within an organization. Further, patent activity is a key metric for venture capital funding[3], so gender disparity in patent filing can correlate to a gender disparity in financial support to entrepreneurial activity. From an organization's point of view, by leaving innovations unpatented, economic value is lost. Further, empirical studies have found that even though women patent less than men, the quality and impact of their patents are equal to or exceed those of men.[4] From a societal view, as the PTO stated in its report, "if women, minorities, and low-income children were to invent patented technology at the same rate as white men from high-income

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[1] Office of the Chief Economist, U.S. Patent & Trademark Office, *Progress and Potential: A Profile of Women Inventors on U.S. Patents* (2019), https://www.uspto.gov/sites/default/files/documents/Progress-and-Potential.pdf.

[2] The Institute for Women's Policy Research, *Briefing Paper: The Gender Patenting Gap*, July, 2016.

[3] Graham, Stuart, J.H., Robert P. Merges, Pam Samuelson, and Ted Sichelman, *High Technology Entrepreneurs and the Patent System: Results of the 2008 Berkley Patent Survey*, Berkeley Technology Law Journal, 24(4) (2009).

[4] McMillan, G., *Gender Differences in Patenting Activity: An Examination of US Biotechnology Industry*, Scientometrics, 80, 683-691 (2009).

households, the rate of innovation in American would quadruple."[5] Simply put, gender parity in innovation is an imperative for the nation's innovation policy and global competitiveness.

Innovative gender parity is better in academic institutions than in the business sector[6]. However, around 85% of patents are awarded to for-profit companies[7]. As such, corporations must play a leading role in effecting cultural change to emphasize and reward diversity in innovation.

3M's Efforts to Increase Innovative Gender Parity

3M is a science-based company focused on developing solutions and products to improve people's lives. As such, 3M has a strong culture of innovation and patenting. The company is so committed to innovation that in 1948 it adopted a program allowing employees to dedicate one day each week to developing their own products. This innovative culture led to 3M being awarded the National Medal of Technology and the 100 Top Global Innovators Award in each of the eight years since the award was created. In 2014, 3M earned its 100,000th patent, highlighting the strong connection between innovation and patenting at 3M. Six 3Mers have been inducted into the National Inventor Hall of Fame, two of whom were women.

3M believes that diversity and inclusion are essential to the company's success. We hire to reflect the diversity of our global customers, suppliers, and channel partners. Once we have this diverse global workforce in place, we retain our talented employees by giving them opportunities, supporting them, and watching them learn and thrive. Our diverse global workforce generates a broader range of ideas than a homogenous group could ever produce. Our inclusive culture fuels collaboration, which is key to unlocking the power of diverse perspectives and creating opportunities for innovative solutions that benefit our customers and our communities. 3M's commitment to inclusion is so strong that each employee is evaluated on inclusiveness as an annual leadership behavior.

Further, in 2011, 3M announced its global initiative to accelerate progress for women throughout the company. In the 2011-2016 timeframe, this initiative resulted in women's representation at the director level increasing from 18.2% to

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[5] Office of the Chief Economist, U.S. Patent & Trademark Office, *Progress and Potential: A Profile of Women Inventors on U.S. Patents* (2019), https://www.uspto.gov/sites/default/files/documents/Progress-and-Potential.pdf.

[6] World Intellectual Property Organization, *Economic Research Working Paper No. 33, Identifying the Gender of PCT Inventors*, November, 2016.

[7] National Science Foundation, Science and Engineering Indicators 2018, available at https://nsf.gov/statistics/2018/nsb20181/report/sections/invention-knowledge-transfer-and-innovation/invention-united-states-and-comparative-global-trends.

23.0%, at the vice president and above levels from 16.7% to 24.2%, for technical and lab managers from 19.1% to 23.9%, for plant managers from 11.4% to 17.4%, for those leading 3M subsidiaries from 2.4% to 22.7%, and for those reporting to the CEO from 12.5% to 20.0%.[8] In 2015, 3M announced its goal to double the pipeline of diverse talent in management by 2025. To measure progress against our 2025 goal, we use a Diversity Index which represents the total number of diverse future leaders within the company globally. Since fourth quarter of 2015, we have increased the number of diverse employees in the management pipeline from 32.6% to 38.3%.

The following are examples of the ways in which 3M is combining our diverse and inclusive culture with our innovative activities to expedite innovative gender parity.

Community Outreach

Community outreach and volunteer-based activities have long been integral to 3M's culture worldwide and are part of the company's vision and leadership behaviors. In recognition of this culture, 3M's Chief IP Counsel, Kevin Rhodes, was a co-founder of the USPTO's Pro Bono Task Force that led to the USPTO Inventor Assistance Program. Notably, Minnesota was the first state to have a patent pro bono program.[9] 3M legal professionals routinely assist low-income or entrepreneurial enterprises with their IP questions through the USPTO's Inventor's Assistance program.

Additionally, 3M has a variety of educational outreach programs to encourage young people, with an emphasis on females and diverse people, to become interested in science and technology. Through our Visiting Wizards program[10], 3M employees visit students in grades 1-6 at local schools and showcase interesting and fun science demonstrations and hands-on experiments on a variety of topics. These simple experiments help youth understand how science can impact everyday life and, when the 3M employee is female or diverse, act as a "you can't be it unless you see it" role model for female and diverse youth to enter into STEM careers. 3M is also active in promoting STEM education at the university level. For example, 3M and the University of Minnesota recently

[8] https://www.catalyst.org/research/3m-im-in-accelerating-womens-leadership/

[9] McDowell, J and VIshnubhakat, S., Cybaris Journal, *The USPTO Patent Pro Bono Program,* 2015, available at https://open.mitchellhamline.edu/cgi/viewcontent.cgi?referer=http://www.google.ca/url?sa=t&rct=j&q=&esrc=s&source=web&cd=6&ved=2ahUKEwjpn837w63hAhWBrFkKHVrhDqYQFjAFegQIBRAB&url=http%3A%2F%2Fopen.mitchellhamline.edu%2Fcgi%2Fviewcontent.cgi%3Farticle%3D1054%26context%3Dcybaris&usg=AOvVaw0Txw8bsCR80cZl7AgL5wOs&httpsredir=1&article=1054&context=cybaris.

[10] *See*, https://www.3m.com/3M/en_US/gives-us/education/visiting-wizards/.

announced their joint *Driven* campaign[11], which reflects a $26M investment that spans a 10-year period to promote scholarships and outreach programs. This investment is helping to build a pipeline of high-performing and diverse global talent, integrate science, technology, engineering and math (STEM) into K-12 education, and prepare students to succeed in science and business.

Internal and External Recognition for Inventive Activities

3M actively recognizes our diverse inventors internally within 3M. We do this through spotlights on these individuals and their activities on our internal website, through videos highlighting their inventions and activities in our common area video monitors, and through internal presentations, conferences, and discussion groups. Inventors receiving patents are honored at monthly or quarterly lab meetings at which they receive a patent plaque. This internal publicity not only recognizes and supports inventive activities by our female and diverse inventors, but also allows other female and diverse employees to see the path to become inventors. On the theory that you can't be it if you can't see it, 3M purposefully celebrates role models that others can identify with and reach out to contact. Additionally, by publicly celebrating inventive work, 3M facilitates collaboration between scientists because technical employees have a name and face that they can easily contact with questions, for advice, or for mentorship or coaching.

3M also actively promotes and recognizes its female inventors externally, through social media and other communication platforms. For example, 3M recently posted an article on 3M's website and on Twitter™ highlighting Audrey Sherman, the first women at 3M to obtain over 100 US patents[12]. Also, 3M created a film series entitled *Beyond the Beaker* that steps outside the lab and into the everyday lives of 3M scientists. The scientists tell their own stories and the short films capture them outside of work, revealing the people behind the science by showcasing their diverse backgrounds, hobbies, and home life[13]. Additionally, 3M recently appointed Dr. Jayshree Seth, a 3M Corporate Scientist with over 60 US patents, as 3M's first-ever Chief Science Advocate. In her role, Dr. Seth raises the awareness and appreciation for science and works to break down the barriers, boundaries, and biases to entering into a career in STEM. 3M provides Dr. Seth with a global platform from which she is empowered to promote the engagement of women and girls in science[14].

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[11] See https://investors.3m.com/news/press-release-details/2017/3M-Investment-in-University-of-Minnesota-Reflects-Shared-Commitment-to-STEM-and-Business-Education/default.aspx

[12] *See, e.g.*, https://news.3m.com/blog/english/3ms-100-patent-woman-audrey-sherman-explains-how-she-did-it and https://twitter.com/3m/status/1095359674302558208).

[13] See e.g., https://www.3m.com/3M/en_US/state-of-science-index-survey/insights/beyond-the-beaker/).

[14] *See, e.g.*, https://amysmartgirls.com/meet-dr-jayshree-seth-chief-science-advocate-at-3m-1c8df164b384

Mentoring, Coaching, and Development Programs

3M has various mentoring, coaching, and development programs for diverse employees, including our female inventors. Not only do we have formal, corporate-wide mentoring programs, but we also have a variety of informal mentoring and coaching programs. For example, each year, 3M has over 20 Lean In circles led by female 3M executives. Also, we have active affinity groups including a Women's Leadership Forum, which is a global effort to accelerate the inclusion and advancement of women worldwide by developing these leaders at all levels of the organization. The Women's Leadership Forum has a Technical Employees chapter that actively engages female 3M technical employees. Our patent professionals regularly connect with this group to provide friendly and accessible faces available for questions and support.

3M's global initiative *I'm in. Accelerating Women's Leadership ("I'm in")* comprises a variety of talent management and leadership development components, including networking, mentoring, talent development, work-life balance, workplace flexibility programs, and external community efforts. *I'm in* has positively impacted people, the work environment and company culture. While the initiative focuses on the advancement of women in the pipeline and across the organization, communications and programs engage and include all 3M employees worldwide.

Leadership in Engaging with Other Companies

3M is a leader in engagement with other corporations to share and replicate best practices for the advancement of gender diversity in innovation. No one company can achieve the national and global shift in gender disparity on their own, and we are strongest when we are united and coordinated in our efforts. 3M is a founder and sustaining board member of the Intellectual Property Owners Association ("IPO"). IPO is a trade association representing companies and individuals in all industries and fields of technology who own or are interested in intellectual property rights. IPO's membership includes more than 200 companies and more than 12,000 individuals involved in the association primarily through their companies or law firms. In 2016, under the presidency of Kevin Rhodes, the Chief IP Counsel from 3M, IPO formed a Women in IP Law Committee. I've been privileged to serve as a co-leader of the Women Inventors sub-committee, whose efforts are aimed at helping member organizations address gender disparity in innovation.

The IPO Women Inventors sub-committee has 2 primary goals or missions:

1. To bring awareness to the issue of gender disparity in innovation
2. To offer tools to help organizations move toward gender parity in innovation faster

To deliver on the first goal, members of our sub-committee routinely speak on gender disparity to raise awareness and to form a broad, global network of organizations looking at ways to address this issue. We have spoken at many conferences and CLEs, and the first comment that is raised at each event is along the lines of "WOW! I didn't know about this issue or these alarming statistics." This has confirmed for me that the first and most important step is to raise awareness of this issue. The USPTO and Congress are in an excellent position to continue to communicate and raise awareness.

To deliver on the second goal, we have created a toolkit that will be publicly available fall, 2019 to assist corporations and organizations in assessing and improving their diversity in innovation. The toolkit allows organizations to self-assess their current innovative gender diversity awareness and status and, depending on those results, aims to direct them to the efforts that will be most effective in advancing their gender diversity to the next level. For some organizations, this is a novel issue, so simply raising awareness within the organization is the first and most important step. For other organizations, there is already a good level of awareness, so their next step is doing a deep dive into root causes within the organization. Finally, some organizations already understand their key root causes but are looking for ideas for how to address them and what has worked in other organizations addressing similar root causes. Developed by using our global network of corporations and organizations with active efforts to address the issue of gender disparity, the toolkit facilitates best practice sharing and brainstorming across companies, technologies, and industries to better identify and address some of the root causes of the gender disparity in innovation. The toolkit is never meant to be a final document; instead, it is meant to be a living document or storehouse of information that organizations constantly review and revise. As such, much of the value of toolkit comes from input from organizations using the toolkit. To that end, over 20 companies, universities, and non-profit organizations are piloting the toolkit now to prepare it for its launch this fall.

No one wants to wait another lifetime for gender parity in innovation. And, quite frankly, we cannot afford to continue to let the innovations of our "lost Einstein's" go unnoticed. We look forward to joining with others to mount a concerted effort to ensure that we see gender parity in innovation in our lifetime.

Conclusion.

Chairman Tillis, Ranking Member Coons and Distinguished Members of the IP Subcommittee, I thank you for the opportunity to appear here today and to offer my views on the subject of "*Women Inventors and the Future of American Innovation*." I appreciate the engagement by Members of this Committee and their staffs as well as the USPTO to engage in discussion about this important

issue. The Roundtable discussions that the PTO is holding in all of its satellite offices, the March 27, 2019 hearing before the House committee on the topic of "*Lost Einsteins: Lack of Patent Inventorship and the Impact on America's Innovation Economy*," and the hearing today are all strong efforts to continue the discussion that began with the passage of the SUCCESS Act and the USPTO's subsequent issuance of the *Progress and Potential Report.*

I would be pleased to answer any questions or to supply additional information for the record.