STATEMENT OF CONSIDERATIONS

REQUEST FOR AN ADVANCE WAIVER OF DOMESTIC AND FOREIGN PATENT RIGHTS BY THE FORD MOTOR COMPANY ("FORD") UNDER VEHICLE TECHNOLOGIES OFFICE LAB CALL (DE-LC-0000005); W(A)2022-002

FORD has requested a waiver of domestic and foreign patent rights for all inventions that may be or have been conceived or first actually reduced to practice by FORD's employees in the course of or under the above referenced 2021 Vehicle Technologies Office ("VTO") Lab Call (DE-LC-0000005) entitled "Electrochemical/Thermal-Optimized Solutions for Extreme Fast Charge" ("subject inventions"). FORD anticipates entering into a subcontract with NREL once this patent waiver is granted.

As set forth in FORD's petition for this waiver, the objectives of the project being funded by the award are to develop and demonstrate battery technologies that enable an electric vehicle ("EV") to quickly refuel in just 10-15 minutes, similar to a typical gasoline-fueled vehicle. At present, today's low-cost energy-dense batteries have thick electrodes that suffer from slow ionic transport and prevent extreme fast charging ("XFC") of EVs. In order to solve this problem, technical solutions are needed to enhance electrolyte transport and mitigate damage due to fast charging, active material cracking, and excessive heat generation. These barriers limit lifetime of EV batteries and increase the need for expensive thermal management.

The period of performance for the subcontract is three (3) years. The total anticipated cost to NREL for the subcontract to Ford is \$554,400 over the 3-year period of performance. NREL and INL are contributing an additional \$3,945,600 for work under this project, resulting in a total cost of \$4,500,000 for the project. For the subcontract, FORD is not contributing any cost share component, which was not required in the Lab Call.

FORD is one of the largest automakers in the world, with vast research and manufacturing capabilities. FORD has a history of developing innovative technical solutions for manufacturing processes, including those in the field of energy storage technologies and applying those technologies to EVs. To date, FORD has invested approximately \$7 billion in EVs, and plans to spend an additional \$30 billion through 2025. Further, FORD is expecting to manufacture 600,000 EVs per year globally by the end of 2023. To achieve this goal, FORD is currently building four EV battery manufacture factories in the U.S. (Georgia, Tennessee, and Kentucky), and one factory in Turkey.

Currently in the XFC technology field, FORD is developing 3-electrode systems to explore the fast-charging capacity of EV cells. In that regard, different reference electrodes have been tested to determine the best choice based on the properties of each reference electrode. For this project, FORD will work with its partners at NREL and INL to use their leading understanding of physical barriers and solutions to co-develop novel electrolytes, advanced electrodes, adaptive electrochemical protocols and optimal thermal controls that will attempt to meet VTO's goal of providing an 80% charge in less than 15 minutes for 235 Wh/kg cells having W(A) 2022-002 p.1 a 1000-cycle, 15-year lifetime. In view of the foregoing, it is reasonable to conclude that FORD can continue to and ultimately be successful in developing, utilizing, and commercializing the technology resulting from the award.

FORD does not anticipate that the granting of this waiver would place FORD in a preferred or dominant position in the fast-charging batteries field. This is because fast charging capability is being actively pursued by numerous entities including research groups, other vehicle manufacturers, cell manufacturers, battery material suppliers, energy storage technology companies and companies whose products use battery power sources. FORD intends to commercialize the inventions covered by this petition to the extent practical, either through its own production or through licensing. If FORD is able to commercialize the technology through its own production, it most likely would become one of many competitors in the field.

This waiver shall be subject to the march-in and preference for U.S. industry provisions, as well as a U.S. Government license, comparable to those set out in 35 U.S.C. 202-204. Further, the waiver shall be subject to the attached U.S. Competitiveness provision paragraph (t). In brief, products embodying a waived subject invention or produced through the use of a waived subject invention will be manufactured substantially in the United Sates unless FORD can show to the satisfaction of DOE that it is not commercially feasible to do so.

Considering the foregoing, it is believed that granting a waiver to possible subject inventions will provide FORD with the necessary incentive to commercialize the results of the award in a manner that will make products that embody the subject inventions available to the public in the shortest time. Therefore, upon evaluation of the waiver petition, and in view of the objectives and considerations set forth in 10 CFR 784, all of which have been considered, it is recommended that the requested waiver be granted.

Jonathan L. ("Jay") Pettit Patent Attorney Golden Field Office

Date:____

Based upon the foregoing Statement of Considerations and representations in the attached waiver petition, it is determined that the interests of the United States and the general public will best be served by a waiver of patent rights of the scope determined above, and therefore the waiver is granted. This waiver shall not apply to any modification or extension of the award, where through such modification or extension, the purpose, scope, or cost of the award has been substantially altered.

CONCURRENCE:	APPROVAL:
David Howell	Rochelle Blaustein
Office Director	Acting Assistant General Counsel for
Vehicle Technologies Office	Technology Transfer and Intellectual
	Property
Date:	/
	Date:

W(A) 2022-002 p.3