

QUESTIONS AND ANSWERS

PLEASE REFER TO THE GENERAL FAQs SECTION OF ARPA-E'S WEBSITE ([HTTP://ARPA-E.ENERGY.GOV/?Q=FAQ/GENERAL-QUESTIONS](http://arpa-e.energy.gov/?q=faq/general-questions)) FOR ANSWERS TO MANY GENERAL QUESTIONS ABOUT ARPA-E AND ARPA-E'S FUNDING OPPORTUNITY ANNOUNCEMENTS. ADDITIONAL QUESTIONS SPECIFIC TO THIS FOA ONLY ARE INCLUDED BELOW. PLEASE REVIEW ALL EXISTING GENERAL FAQs AND FOA-SPECIFIC QUESTIONS BEFORE SUBMITTING NEW QUESTIONS TO ARPA-E.

I. Full Application Questions:

Q1. I HAVE QUESTIONS ABOUT THE DE-FOA-0002784 B. INCREASING TRANSPORTATION EFFICIENCY AND RESILIENCY THROUGH MODELING ASSETS AND LOGISTICS (INTERMODAL).

(1) IS CATEGORY 2 LIMITED TO CONTAINERS ONLY, OR DOES IT ALSO INCLUDE TRAILERS?

(2) WHAT IS THE MEANING OF "<24 HR" AND "<1 HR" IN THE CONTEXT OF THE FULL SYSTEM (GLOBAL) AND LOCAL OPTIMIZATION FOR EXISTING ROUTES SHOWN IN FIGURE 3 OF THE FOA?

(3) ON PAGE 3, FIGURE 3. LOGISTICS MODEL.

SCOPE: COMPLETE NATIONAL INTERMODAL CHAIN FROM PORT ENTRY TO WAREHOUSE.

DOES THIS MEAN IT ONLY CONSIDERS CONTAINERS FROM PORTS TO WAREHOUSES? HOW ABOUT CONTAINERS FROM WAREHOUSES TO PORTS? AND ALSO BETWEEN WAREHOUSES IN THE US?

ANSWER: 1. The goal of Category 2 is to create a full system and real-time model for optimization of national intermodal logistics scheduling, for the purpose of increasing system-wide operational energy efficiency. Figure 3 illustrates the main components of this technical category. The scope of this category includes freight transportation by water, rail, and road.

Category 2 is not limited to containers and can include trailers.

2. Category 2: Intermodal Logistics Model - A complete and validated set of logistics models of the national intermodal freight transportation system that enable predictive and responsive optimization of modal choice, inter- or intramodal transfer, and routing. The logistic model must operate both as a full (<24hr) intermodal system planning tool and a quasi-real-time (<1hr) dynamic scheduler. Category 2 efforts are encouraged to consider and enable optimization around likely future infrastructure rollout as modeled in Category 1.

3. The goal of Category 2 is to create a full system and real-time model for optimization of national intermodal logistics scheduling, for the purpose of increasing system-wide operational energy efficiency.

Q2. WE INTEND TO SUBMIT AN APPLICATION BUT HAVE A FEW QUESTIONS. COULD YOU CAN HELP OR DIRECT US TO SOMEONE WHO CAN HELP ANSWER?

- A. PLEASE ADVISE ON PARTIES THAT CAN BE THE PRIME RECIPIENTS.**
- B. WE UNDERSTAND UNDER SECTION III.B THAT THE PROJECT COST SHARING IS 10 PERCENT. COULD YOU PLEASE COMMENT ON THAT?**
- C. UNDER THE TEAM ORGANIZATION AND CAPABILITIES, ARE WE DESCRIBING THE CURRENT TEAM OR SHOULD WE INCLUDE ALL THE FUTURE TEAM FOR THE 30 MONTHS PROJECT THAT WE MIGHT NOT HAVE CURRENTLY? FOR EXAMPLE, IF WE PLAN TO HAVE DATA EXPERTS IN YEAR 3, DO WE INCLUDE THAT EXPERTISE IN THE PROPOSAL?**

ANSWER: A. For eligibility criteria, see Section III.A of the FOA.

B. For cost share requirements, please see Section III.B of the FOA.

C. It is recommended to have all (future included) participants on the project included in the proposal.

Q3. WE ARE PUTTING TOGETHER A PROPOSAL FOR THE INTERMODAL OPTIMIZATION FOA. COULD YOU PROVIDE CLARIFICATION ON THE SCALE OF ANALYSIS EXPECTED? E.G. THE ASSUMPTION IS THAT IT SHOULD BE NATIONWIDE, BUT GIVEN DATA LIMITATIONS IS ARPA-E ALSO CONSIDERING REGIONAL OPTIMIZATION MODELS? FOR EXAMPLE, THE WESTERN INTERCONNECT WITH MULTIPLE STATES FOR NON AND ON ROAD MODES, BUT NOT TOTALLY NATIONAL IN SCOPE.

ANSWER: The overarching goal of this program is to demonstrate deployment and operational strategies that bring freight transportation in line with national net-zero-by-2050 targets. Examples of publicly available data sets are given in FOA. The applicant is not limited to these data sources. All required data sets must be explicitly stated in the application. Data availability should allow for higher fidelity in a region.

Q4. IS THE PRINCIPLE INVESTIGATOR A PERSON THAT'S RESPONSIBLE FOR THE PROJECT OR SOMEONE IN THE RESEARCH HAS AN ACADEMIC RANK?

ANSWER: The Principal Investigator (PI) is the key individual designated by the applicant to direct the project. The PI must be knowledgeable in all technical aspects of the application and be capable of leading the research effort.

Q5. –REDACTED—QUESTIONS ON DE-FOA-0002784 – INTERMODAL ===

1) CAN YOU CLARIFY THE DEFINITION OF THE ADDRESSABLE FREIGHT MARKET FOR THE “NATIONAL INTERMODAL FREIGHT TRANSPORTATION SYSTEM”?

A. THE DOCUMENT REFERENCES IMPORT FLOWS (THE FIGURE FOR “CATEGORY 2 REQUIREMENTS” STATES THE SCOPE IS “COMPLETE NATIONAL INTERMODAL CHAIN FROM PORT ENTRY TO WAREHOUSE”) BUT NOT EXPORTS, DOMESTIC, OR ‘BRIDGE MOVES’ (BETWEEN MEXICO AND CANADA) FREIGHT FLOWS.

ARE YOU SEEKING A MODEL THAT EXCLUSIVELY CONSIDERS THE IMPORT FLOW OF INTERNATIONAL INTERMODAL CONTAINERS (I.E., 20FT, 40FT AND 45FT CONTAINERS)?

EVEN IF YOUR INTENT IS TO FOCUS SOLELY ON THE MOVEMENTS OF MARITIME CONTAINERS, WE RECOMMEND THAT THE DOMESTIC, EXPORT, AND ‘BRIDGE MOVES’ ARE ALSO CONSIDERED AS THE MARITIME IMPORT CONTAINERS WILL FREQUENTLY SHARE THE SAME TRAIN AND TERMINAL CAPACITY.

ANSWER: Please see Appendix B, Section 3.B of the FOA - The goal of Category 2 is to create a full system and real-time model for optimization of national intermodal logistics scheduling, for the purpose of increasing system-wide operational energy efficiency. Other aspects of freight logistics can be included.

B. WHEN ADVISING OUR CLIENTS, WE TYPICALLY CONSIDER ALL GOODS MOVING IN DRY-VAN TRUCKS OVER ~250 MILES AS ADDRESSABLE BY THE DOMESTIC INTERMODAL (I.E., 53FT CONTAINERS AND 53FT TRAILER ON FLAT CAR [TOFC]) PRODUCTS OFFERED BY THE INTERMODAL MARKETING COMPANIES. CAN WE CONFIRM THAT IT IS DESIRABLE AND ALIGNED TO ARPA-E’S OBJECTIVES TO INCLUDE THE ENTIRE INTERMODAL ADDRESSABLE MARKET (IMPORT, EXPORT, DOMESTIC AND BRIDGE) IN THE SCOPE OF CATEGORY 2?

ANSWER: You are allowed to include the entire intermodal freight system.

C. THERE ARE TECHNOLOGIES WHICH EXIST (E.G., ISO TANK CONTAINERS) FOR MOVING BULK COMMODITIES USING INTERMODAL. TO UNDERSTAND THE OPPORTUNITY, CONGESTION AND RESILIENCE OF A FREIGHT NETWORK WITH A HIGHER SHARE OF INTERMODAL, WE RECOMMEND INCLUDING THESE COMMODITIES AS WELL.

CAN YOU CONFIRM IF ANY SPECIFIC COMMODITIES SHOULD BE EXCLUDED FROM THE MODEL DESIGN?

ANSWER: The scope of the system is defined in Appendix B, Section 3. of the FOA. Other aspects of the freight system can be included.

D. THE RAILROAD AND LOGISTICS INDUSTRY CONTINUE TO INVEST IN TRANSLOADING FACILITIES THAT FALL INTO TWO CATEGORIES:

I. TRANSLOADING FREIGHT FROM INTERNATIONAL INTERMODAL CONTAINERS (40FT AND 20FT) TO DOMESTIC INTERMODAL CONTAINERS (53FT) OR DRY-VANS FOR OVER-THE-ROAD TRUCKING. PLEASE CONFIRM THAT THIS ACTIVITY IS INSIDE THE SCOPE OF CATEGORY 2 AND A KEY FACTOR IN THE MODAL CHOICE.

ANSWER: The scope of the system is defined in Appendix B, Section 3. of the FOA. Other aspects of the freight system can be included.

II. TRANSLOADING BULK FREIGHT FROM RAILCARS TO/AND FROM TRUCKS TO ACCESS INDUSTRIAL FACILITIES WITHOUT RAIL ACCESS. THESE BULK TRANSLOAD TERMINALS HANDLE BULK LIQUIDS, GRAIN, SAND, PALLETIZED FREIGHT, FREIGHT REQUIRING FLATBED TRUCKS AND OTHER COMMODITIES.

SHOULD WE CONSIDER THIS FREIGHT AS ADDRESSABLE FOR "INTERMODAL"? WE BELIEVE THAT ADDRESSING THIS SEGMENT OF THE OVER-THE-ROAD FREIGHT IS IMPORTANT FOR UNDERSTANDING THE FULL ECO-SYSTEM OF FREIGHT MOVEMENT IN THE USA.

ANSWER: The scope of the system is defined in Appendix B, Section 3. of the FOA. Other aspects of the freight system can be included.

2) TIME HORIZONS FOR MODEL OPTIMIZATION:

IN THE DOCUMENT, YOU SPECIFICALLY REQUEST THE APPLICANT TO "CREATE A FULL SYSTEM AND REAL-TIME MODEL FOR OPTIMIZATION OF NATIONAL INTERMODAL LOGISTICS SCHEDULING."

A. WHAT DOES 'REAL-TIME' REALLY MEAN IN THIS CONTEXT? WHO ARE THE TARGET USERS?

IN OUR EXPERIENCE ADVISING MAJOR FREIGHT CARRIERS (TRUCKING, RAIL, AIR AND PARCEL) AND SHIPPERS, THE TIME HORIZON FOR DECISION MAKING IS SIGNIFICANTLY LONGER THAN THE “FULL SYSTEM (GLOBAL) OPTIMIZATION FOR EXISTING ROUTES (<24 HR)” YOU REQUEST. THE VELOCITY OF FREIGHT MEANS DECISIONS ARE MADE BASED ON CONTRACTED RATES NEGOTIATED ANNUALLY. MODE CHOICE CAN BE DRIVEN BY CAPACITY AND THE SPOT MARKET THAT DAY; HOWEVER, IT IS UNUSUAL FOR OPTIMIZATION AT THE <24HR TIME HORIZON TO FEATURE IN CURRENT-STATE DECISIONS OR BE ACTIONABLE WHEN TRANSIT-TIMES ARE MEASURED IN HOURS OR DAYS.

IN ADDITION, THE UNDERLYING FREIGHT VOLUME DATA IS RARELY AVAILABLE AT A TIME HORIZON APPROPRIATE FOR A DAILY OPTIMIZATION TO UNDERSTAND NETWORK CONGESTION AND SECONDARY EFFECTS.

CAN YOU CONFIRM THAT, EXCLUDING SOME SPECIFICS NOTED BELOW, A SOLUTION WHICH OPTIMIZES GLOBALLY FOR A LONGER TIME HORIZON APPROPRIATE FOR THE UNDERLYING DATA REMAINS ELIGIBLE FOR CONSIDERATION?

ANSWER: The time horizon is clearly specified in Appendix B, Section 3. of the FOA. Others can be included.

B. WHEN YOU TALK ABOUT “LOCAL OPTIMIZATION” AND “PERTURBATION MODEL”, ARE YOU ASSUMING REAL-TIME FEEDS OF NETWORK (ROAD, RAIL, ETC.) EXIST IN THE PUBLIC DOMAIN? RAILROADS SPECIFICALLY, BUT ALSO HIGHWAY AGENCIES, MAY NOT FORECAST DISRUPTIONS AT AN ACTIONABLE LEAD TIME FOR THE TARGET USERS.

ANSWER: The logistic model must operate both as a full intermodal system planning tool (<24hr) and a quasi-real-time (<1hr) dynamic scheduler. (See Appendix B, Section 3. of the FOA).

C. IN OUR RESPONSE, WE MAY NEED TO REFERENCE THIRD-PARTY PROPRIETARY DATASETS UNAVAILABLE TO A BASIC USER TO ACCESS THE REAL-WORLD, LIVE (OR RECENT) TRAFFIC DATA (E.G. GOOGLE MAPS TRAFFIC DATA FEEDS). WOULD THE USE OF ANY PROPRIETARY DATASETS TO ACHIEVE THE RESPONSIVE OPTIMIZATION BE DISQUALIFYING?

ANSWER: For proprietary data, see Appendix B, Section 3.C.1 of the FOA.



3) INTEGRATION WITH CATEGORY 1 MODEL SOLUTIONS

A. DO YOU HAVE A PREFERRED STRUCTURE FOR THE PLANNED INTEGRATION BETWEEN ANALYTICAL TOOLS DEVELOPED FOR CATEGORY 1 AND CATEGORY 2? ARE THERE STANDARD NETWORK REPRESENTATIONS (E.G. GRAPH MODELING LANGUAGE [GML] FILES) THAT CAN BE AGREED ON UPFRONT TO MAKE THESE SETS OF MODELS MOST USEFUL? WE BELIEVE THIS WILL ADD SIGNIFICANT VALUE TO ANY AWARDS ARPA-E SELECT FOR CATEGORY 1.

ANSWER: For Category 1, see Appendix B, Section 3.A of the FOA.

4) COMMERCIALIZATION CLARIFICATIONS

THE TECHNOLOGY TO MARKET (T2M) CHAPTER OF THE TECHNICAL VOLUME TOPIC B REQUESTS BOTH A COMMERCIALIZATION PLAN AND A “LOW OVERHEAD” MODEL AND INTERFACE FOR USE BY PUBLIC USERS.

CAN YOU CLARIFY THE FOLLOWING QUESTIONS ON COMMERCIALIZATION:

A) “ARPA-E IS REQUIRING THAT THE EXECUTABLE CODE FOR ANY MODELS DEVELOPED UNDER THIS TOPIC BE MADE PUBLICLY AVAILABLE AT NO MORE THAN A NOMINAL COST TO THE USER, WITH NO RESTRICTION ON FURTHER USE. ... APPLICANTS SHOULD PROPOSE MODELS WHICH HAVE INTERFACES THAT ALLOW FOR “LOW OVERHEAD” UTILIZATION FOR PUBLIC USERS.”

A. WOULD THIS BE DISTRIBUTED, PUBLISHED AND MAINTAINED BY ARPA-E OR BY THE AWARDEE?

ANSWER: By the Awardee.

B) “TO THE EXTENT THE MODEL TO BE DISTRIBUTED REQUIRES ACCESS TO ADDITIONAL SOFTWARE NOT AVAILABLE AS COMPATIBLE OPEN SOURCE, SUCH ADDITIONAL SOFTWARE MUST BE PUBLICLY AND READILY AVAILABLE AT A REASONABLE COST TO ANY USERS OF THE MODEL.”

A. IF THE AWARDEE IDENTIFIES OR RECOMMENDS USERS OPERATE THE MODEL USING ADDITIONAL SOFTWARE OR DATA SOURCES NOT CONTROLLED BY THE AWARDEE (E.G. FOR-PURCHASE THIRD-PARTY PROPRIETARY DATASETS, OR PURCHASED DATA FEEDS LIKE GOOGLE MAPS FOR DOOR-TO-DOOR ROUTING), IS OFFERING AN ALTERNATIVE FREE-OF-CHARGE SOURCE, ALBEIT AT LOWER FIDELITY, A SUITABLE OPTION?

ANSWER: Offering both options is acceptable.

C) "THE RECIPIENT MAY ASSERT A COPYRIGHT IN ANY DISTRIBUTED PROGRAM SUBJECT TO PROVISIONS THAT WILL BE CONTAINED IN THE AWARD."

A. ARE WE CORRECT THAT THE AWARDEE WOULD OWN THE COPYRIGHT AND INTELLECTUAL PROPERTY CONTAINED WITHIN THE SOLUTION, AND COULD FREELY COMMERCIALIZE A SOFTWARE APPLICATION LEVERAGING THE MODELS DEVELOPED WITH ARPA-E FUNDING INTO FUTURE SOFTWARE PRODUCTS WITHOUT RESTRICTION?

ANSWER: Attachment 2 to the award provides for the rights that are retained by the Government in IP, but those retained rights should not impair the ability of the awardee to freely commercialize a software application that results from the award. Any future software products developed at private expense outside of any award by the Government would not be subject to any retained government rights in the future products.

D) WHAT RESPONSIBILITIES DOES THE AWARDEE HAVE FOR MAINTENANCE AND SUPPORT OF THE MODEL? WHAT CONSTITUTES A COMPLETION OF CONTRACT SUCH THAT ANY THIRD-PARTY CHANGES TO UNDERLYING SOFTWARE OR DATA SOURCES THAT IMPACT OPERATION OF THE MODEL WOULD NOT BE THE RESPONSIBILITY OF THE AWARDEE WITHOUT ENTERING INTO A NEW AGREEMENT?

ANSWER: The Awardee has no responsibility by the provisions of this award to maintain or support a model beyond what is required under the milestones of the award. However,

note that Attachment 4 contains ongoing reporting obligations that survive beyond the period of performance of the award.

5) CLARIFICATIONS ON THE COST-SHARE REQUIREMENTS:

A. CAN YOU CONFIRM THE EXPECTED COST SHARE FOR A LARGE BUSINESS APPLYING FOR THIS GRANT?

ON PAGE 16 OF DE-FOA-0002784 IT SUGGESTS THAT LARGE BUSINESSES "ARE STRONGLY ENCOURAGED TO PROVIDE MORE THAN 20% OF THE TOTAL PROJECT COST AS COST SHARE." SUBSEQUENTLY, IT REFERENCES AN "UNDER AN 'OTHER TRANSACTION' AGREEMENT, THE PRIME RECIPIENT IS NORMALLY EXPECTED TO PROVIDE AT LEAST 50% OF THE TOTAL PROJECT COST AS COST SHARE."

ANSWER: For cost share requirements, please see Section III.B of the FOA.

B. DOES THE INCLUSION OF PREVIOUSLY DEVELOPED INTELLECTUAL PROPERTY (I.E. EXISTING PROPRIETARY MODELS OR DATASETS) WHICH WOULD

BE A CORE PART OF THE PROPOSED SOFTWARE SOLUTION COUNT AS AN 'IN-KIND' CONTRIBUTION?

ANSWER: ARPA-E does not pre-assess budget submissions. Cost share contributions must be in accordance with 2 C.F.R. 200.306.

6) CLARIFICATIONS ON THE PROCESS FOR THE LEGAL AND CONTRACTING OF AWARDING THE GRANT:

A. WITH RESPECT TO THE FUNDING OR TRANSACTION AGREEMENT THAT WOULD BE PUT IN PLACE FOR THE GRANT, WOULD THE APPLICABLE STANDARD TERMS AND CONDITIONS BE NEGOTIABLE? COULD GRANTEEES SUGGEST MODIFICATIONS OR ADDITIONAL PROVISIONS THAT WOULD BE MUTUALLY ACCEPTABLE TO ARPA-E?

B. FOR ANY MODELS DEVELOPED UNDER THIS TOPIC THAT ARE MADE PUBLICLY AVAILABLE, CAN RECIPIENTS BUILD IN END USER LICENSE AGREEMENTS OR SIMILAR SUCH DOCUMENTATION FOR USERS OF THE MODELS?

ANSWER: A. Agreement templates may be found at [Funding Agreements | arpa-e.energy.gov](#) and the terms of "attachment 1" are largely non-negotiable. Other attachments have certain terms that are negotiable.

B. Licenses for users of models must comply with the requirements set forth in the FOA, which will also be reflected in the provisions of Attachment 2 of the award.

Q6. IS THE UPPER LIMIT TO THE RANGE OF APPROXIMATE AWARD SIZE PROVIDED FOR INTERMODAL (WHICH WAS \$1,000,000–\$2,500,000) MEANT TO SERVE AS THE MAXIMUM FEDERAL SHARE OR THE ALLOWABLE TOTAL PROJECT COST INCLUDING ALL COST SHARE?

ANSWER: The federal share of Category A awards may vary between \$1,000,000 - \$2,500,000. The federal share of Category B awards may vary between \$500,000 - \$1,500,000.

Q7--REDACTED--OUR SUB-APPLICANT WILL BE PERFORMING MORE THAN 10% OF THE PROJECT, THUS WE ARE FILLING OUT OUR OWN BUDGET JUSTIFICATION DOCUMENT. OUR SUB-APPLICANT CURRENTLY DOES NOT HAVE AN APPROVED FRINGE BENEFIT RATE OR FEDERAL RATE.

THUS, WHAT FRINGE RATE SHOULD WE BE USING FOR THE REQUEST? DURING A PREVIOUS DOE GRANT, DOE APPROVED OUR SUB-APPLICANT TO USE A 10% FRINGE RATE. ARE WE ABLE TO USE THAT SAME RATE?

CONSIDERING THAT OUR SUBAPPLICANT IS ALREADY WORKING WITH DOE ON ANOTHER PROJECT THAT USES A 10% FRINGE RATE, WOULD WE STILL NEED TO FILL OUT THE INDIRECT RATE PROPOSAL FORM?

ANSWER: If selected for award negotiations, a non-federal entity that wants to charge fringe benefits to a project and does not have an approved fringe benefit rate would most likely need to submit the indirect rate proposal form.

Q8. --REDACTED--I AM ASSISTING A FACULTY MEMBER WHO IS APPLYING TO DE-FOA-0002784 AS THE PRIME, ALONG WITH 2 SUBRECIPIENTS.

THE 2 SUBRECIPIENTS DO NOT HAVE A FEDERALLY NEGOTIATED INDIRECT RATE AGREEMENT. I HAVE READ THROUGH THE FAQ PAGE -- AND THE BUDGET WORKBOOK/GUIDANCE -- AND AM HOPING FOR SOME ADDITIONAL CLARITY.

I UNDERSTAND AN INDIRECT RATE PROPOSAL WOULD BE SUBMITTED DURING AWARD NEGOTIATION. IN THE MEANTIME, THOUGH, ARE THERE ANY SPECIFIC INSTRUCTIONS FOR INCLUDING A RATE WHEN CREATING THE BUDGET? CAN THEY SIMPLY INCLUDE A RATE THEY DETERMINE IS JUSTIFIABLE?

ANSWER: The Prime Recipient is responsible for negotiating its subrecipients' rates in accordance with 2 C.F.R. 200.332(a)(4). The negotiated indirect rate between the pass-through entity and the subrecipient may be based on a prior negotiated rate between a different pass-through entity and the same subrecipient or the subrecipient may elect to use the 10% de minimis indirect cost rate in accordance with 2 C.F.R. 200.414(f).

If selected for award negotiations and in the absence of a federally negotiated indirect rate agreement, non-federal entities may elect to negotiate an indirect cost rate with ARPA-E for an award resulting from this FOA.