Vehicle Technology Primer

Assessing the investment and policy implications of mobility technology for the US Army, and Industry

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Vehicle Technology Primer

How do you make technology choices in a rapidly changing environment?

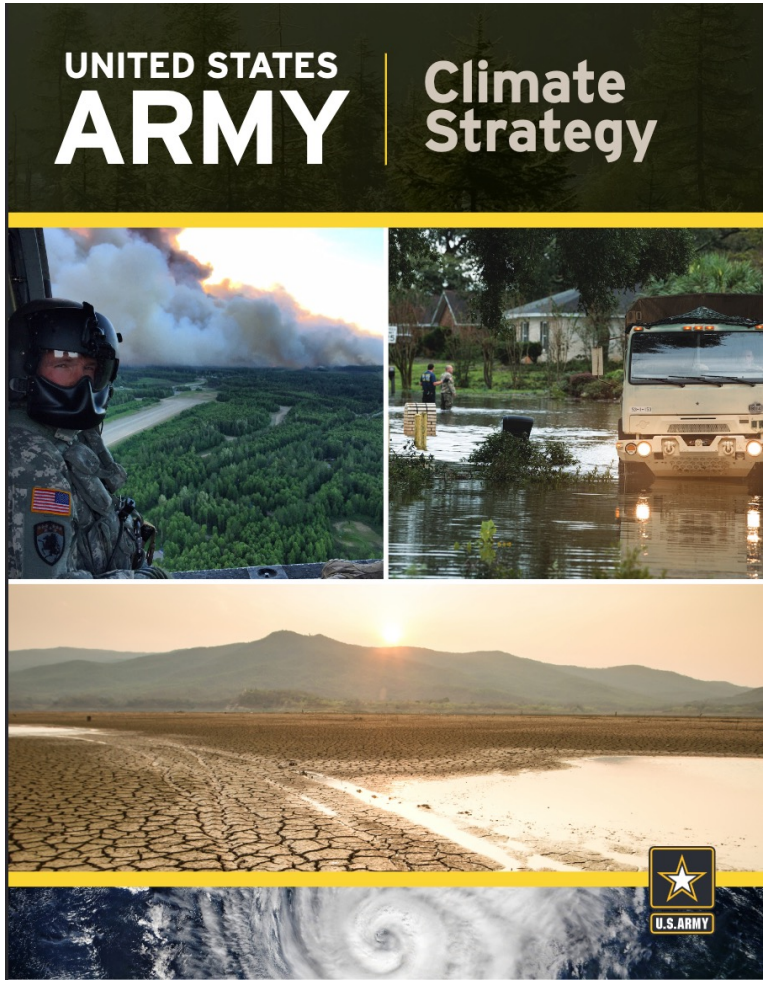
Climate Change is a National Security Priority

Climate change impacts the world and the way the US Military operates in it, both abroad and at home. Climate change:

- Threatens critical infrastructure
- Increases global instability
- Devalues U.S. leadership
- Serves as a significant threat multiplier

The Department will immediately take appropriate policy actions to prioritize climate change considerations in our activities and risk assessments, to mitigate this driver of insecurity...It is a national security issue, and we must treat it as such.

-Secretary of Defense, Llyod Austin



Vehicle Technology Primer

- CCI's Vehicle Technology Primer evaluates vehicle technologies, and advanced materials in four categories
  - Regulatory/policy
  - Readiness
  - Performance
  - Life Cycle Assessment

Technologies Evaluated

- HFO-1234yf Refrigerant
- NMC Battery
- Hydrogen Fuel Cell System

Vehicle Technology Primer - VTP


Evaluation Summary


Regulatory and Policy


Readiness Assessment


Performance Impact


Lifecycle Sustainability

Life Cycle Sustainability

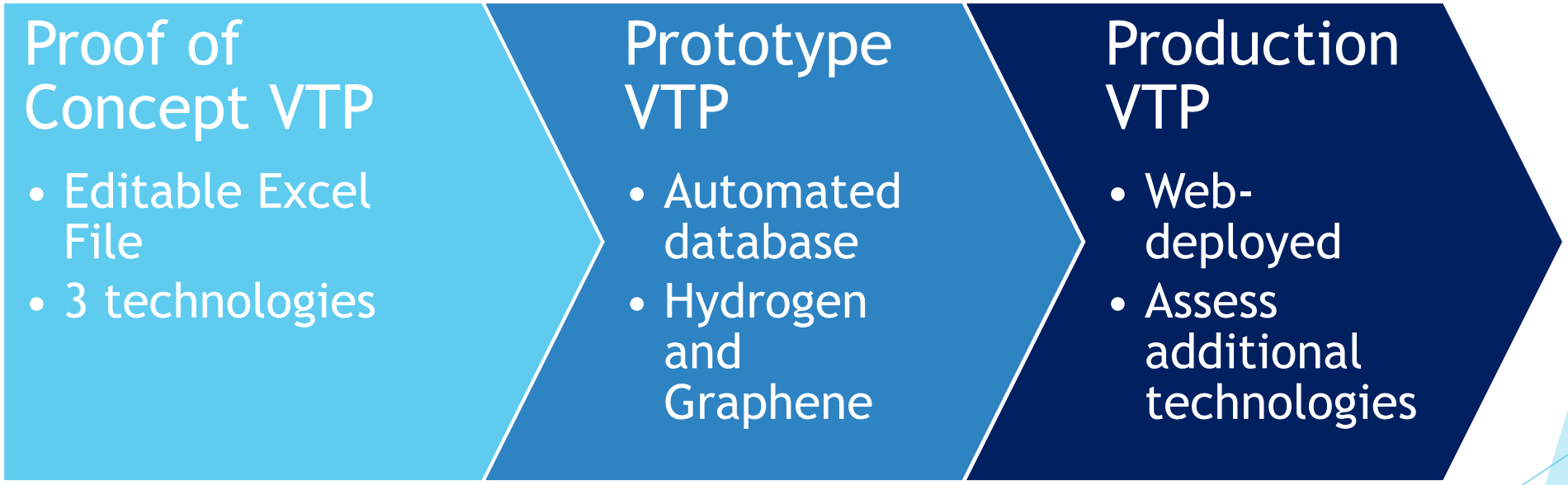
- Sustainability Impact Categories
  1. Climate Change
  2. Air Quality
  3. Water Quality
  4. Soil Quality
  5. Hazardous/Toxic Materials
  6. Hazardous Waste

- Evaluate with an LCA perspective
  1. Raw Material Extraction & Processing
  2. Manufacturing & Processing
  3. Transportation
  4. Operation and Use
  5. Maintenance
  6. End of Life

Climate change summary evaluation for refrigerant HFO1234yf

Life Cycle Sustainability	Climate Change Summary
Overall Life Cycle Sustainability Assessment	The GHG emissions from the upstream processes (raw material extraction and processing and the manufacturing and processing of HFO1234yf) are greater than the emissions from the use and maintenance [cooling systems] of HFO1234yf. HFO1234yf has a low GWP relative to other available refrigerants resulting in low GHG emissions potential from the use and maintenance phases. Emissions from the EOL of HFO1234yf should be low because refrigerants are generally recycled or reclaimed and not released to the atmosphere.

Timeline


Proof of Concept VTP
• Editable Excel File
• 3 technologies
Prototype VTP
• Automated database
• Hydrogen and Graphene
Production VTP
• Web-deployed
• Assess additional technologies

Summary

- Evolution of the VTP
- Critical to the US Army to embed sustainability in their practice

Thanks also to the team:

- Brett Smith
- Edgar Faler
- Michael Ger
- Marc Rosenmayr
- Nick Kemp
- Ground Vehicle Systems Command

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