

Appalachian Regional Clean Hydrogen Hub

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Evaluation Meeting

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OCED005

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Why ARCH2

RESOURCES

- Largest natural gas-producing formation in the United States (EIA, 2022)
- Natural gas spot prices consistently discounted to Henry Hub
- Renewable electricity sources for H₂ production
- Subsurface CO₂ and H₂ storage



COMMUNITIES

- Long history of energy production vital to US economic growth
- Disadvantaged by energy transition from coal
- Designated ENERGY COMMUNITY by IWG



LOCATION

- Close to major demand centers in all directions key for interhub connectivity
- Includes eight of the top 25 priority communities as designated by the Interagency Working Group (IWG) on Coal and Power Plant Communities and Economic Revitalization



APPALACHIA

Project Development Partners

- Decades of expertise in the region
- Strong financial commitment to ARCH2
- Leadership in ESG and Climate initiatives



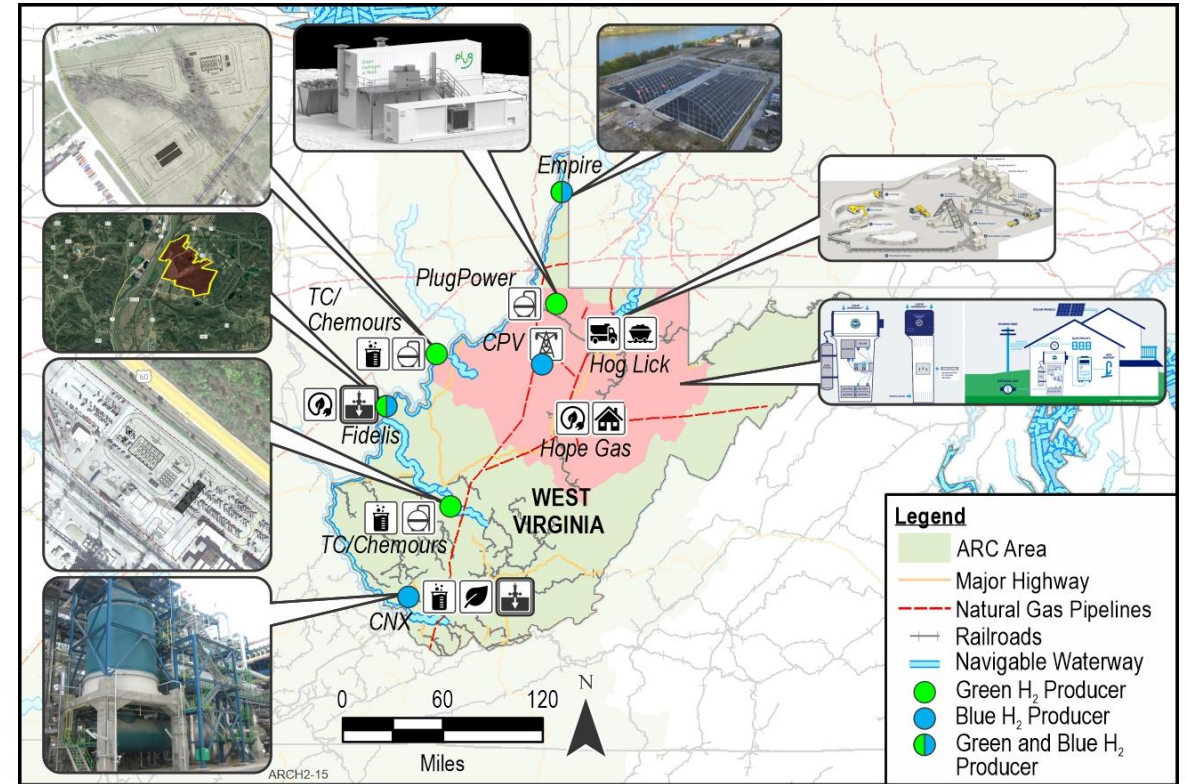
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Market Diversity and Lift-Off

- ARCH2 companies were down selected from 100 candidate projects to 14 selected projects
- Viable using existing or new small-scale infrastructure
- Use of existing rights-of-way for H₂ and CO₂, including for transport and storage
- 60% of the H₂ produced for chemical manufacturing
- Remaining H₂ used in transportation and distributed and industrial power
- ARCH2 total investment \$6.21B, comprised of \$4.97B in private sector cost share.
- 5 different end-products serving 4 sectors
- Hydrogen production – 2,192 MTPD
- Cost of Hydrogen - \$2.25/kg-H₂
- Well-to-Gate CI- 1.2 kg-CO₂e/kg-H₂
- Efficiency – 2.12 GJ/Kg-H₂

ARCH2 Project Summaries

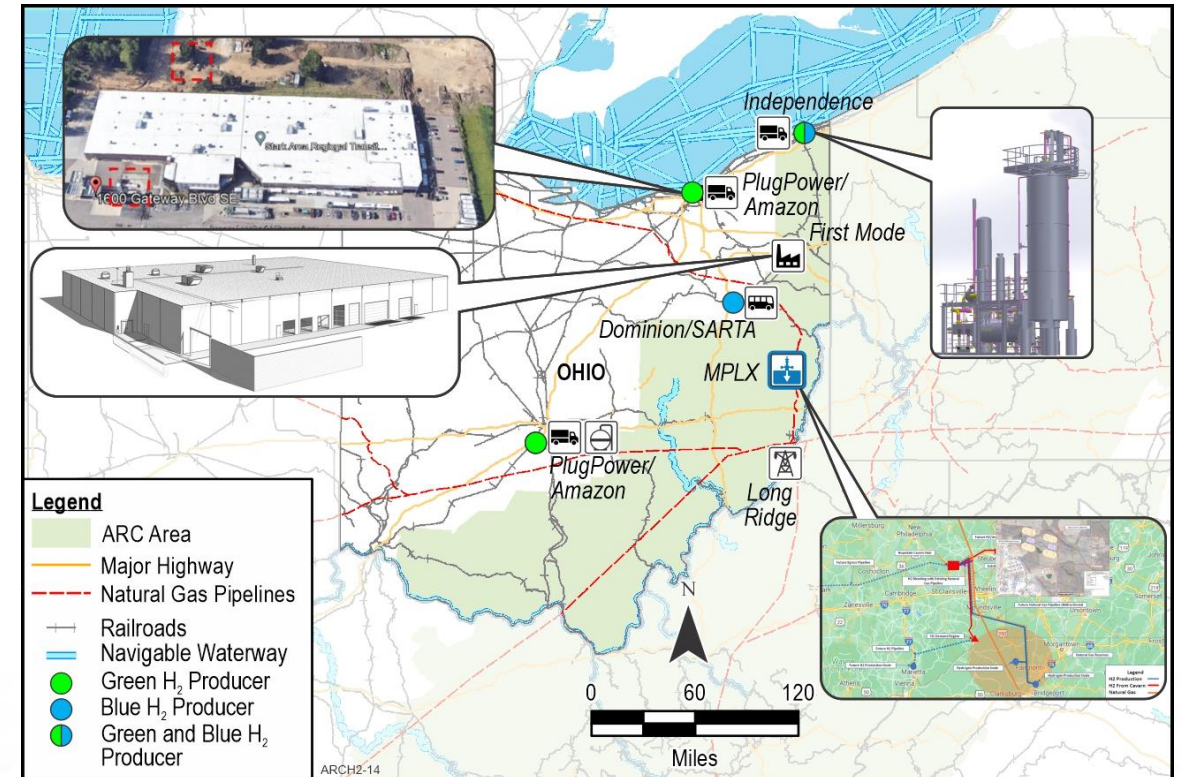
- **CNX:** Low-CI ammonia production
- **TC Energy/ Chemours:** Electrolysis-based H₂ production in two chemical facilities
- **Fidelis / Mountaineer GigaSystem:** NG + biomass to produce Low CI H₂ for datacenters, other off-takers.
- **HLA:** H₂ off-taker: H₂ use as fuel for off-site aggregate delivery trucks and on-site haul trucks/equipment.
- **Hope Gas/ WATT Fuel Cell Corp / EQT:** Produce clean H₂ from NG for blending in Hope local distribution system and residential fuel cells.
- **Empire Diversified Energy:** Anaerobically digested food waste based H₂ production for industrial and transportation fuel.
- **Plug Power:** Green H₂ production facility in northern WV.



Note: Proposed project locations based on preliminary siting are subject to change during the detailed planning phase (phase 1).

ARCH2 Project Summaries

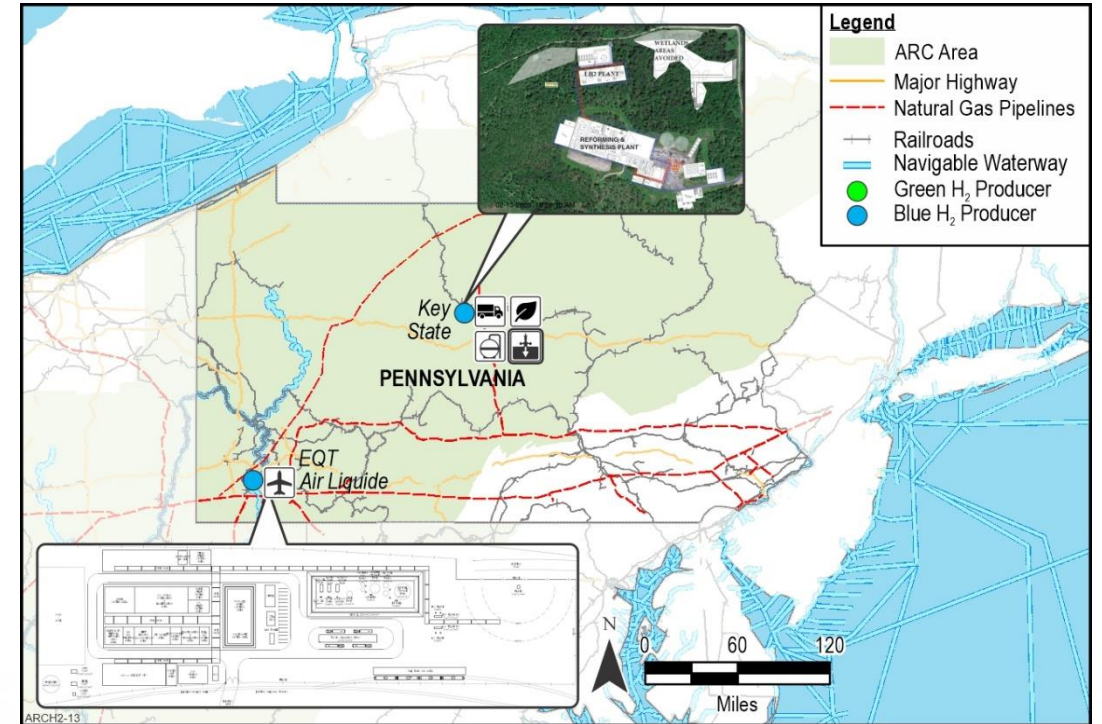
- **MPLX:** H₂ storage facility development with connective infrastructure to support ARCH2 producers, storage, and end-users
- **Enbridge Ohio:** H₂ production with CO₂ capture to supply H₂ to regional transit (e.g., SARTA)
- **Plug Power/ Amazon:** One distribution center with H₂ fueling MHE; fueling station FCEV delivery trucks.
- **First Mode:** H₂ end-user: Manufacturing facility for retrofitting mining trucks with H₂ fuel cell power system.
- **Independence Hydrogen:** H₂ production facility using industrial off-gas as feedstock in Ashtabula, Ohio to provide clean hydrogen for material handling equipment at distribution centers.



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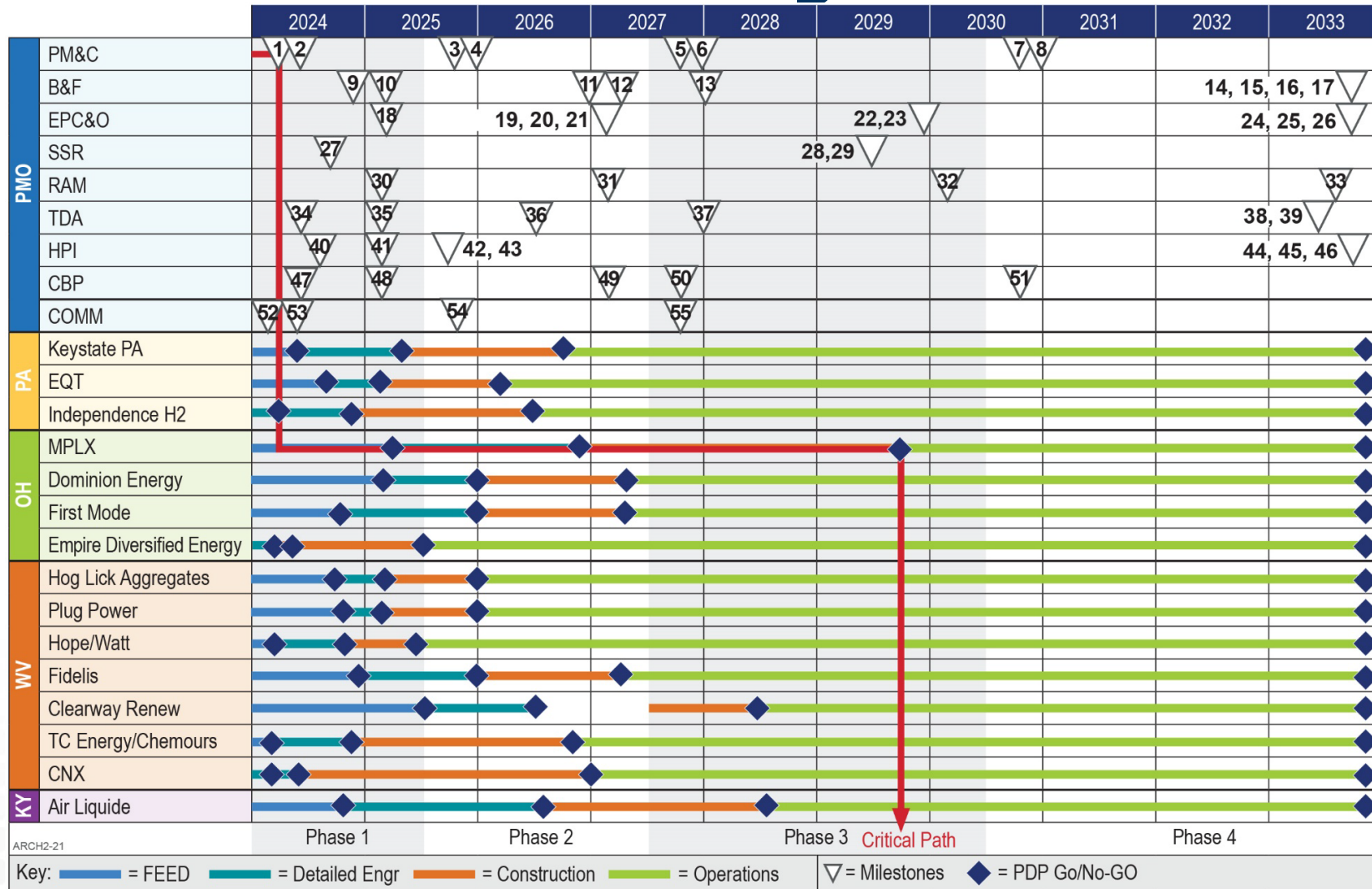
ARCH2 Project Summaries

- **EQT-GTL:** Low-carbon NG and renewable natural gas (RNG) (as required) to produce low-carbon aviation fuel.
- **Air Liquide** - Liquified H₂ facility in southwest PA to serve as an offtake for EQT's excess hydrogen to be used in the mobility sector.
- **KeyState:** H₂ production plus other products (NH₃, urea/diesel exhaust fluid (DEF))



Note: Proposed project locations based on preliminary siting are subject to change during the detailed planning phase (phase 1).

Proposed ARCH2 Project Schedules



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ARCH2 Regional Outreach

Labor / Trades / Workforce Development



> 10 unions, trades organizations, and employment agencies

Business Development / Industry Organizations



THE MIDWEST HYDROGEN CENTER OF EXCELLENCE
A Key Initiative of the Renewable Hydrogen Fuel Cell Collaborative

> 40 service providers

Community / Environment / Non-Profits



> 15 environmental, special interest groups, and faith-based organizations

Academia



> 15 universities, community colleges, and trade schools

Government



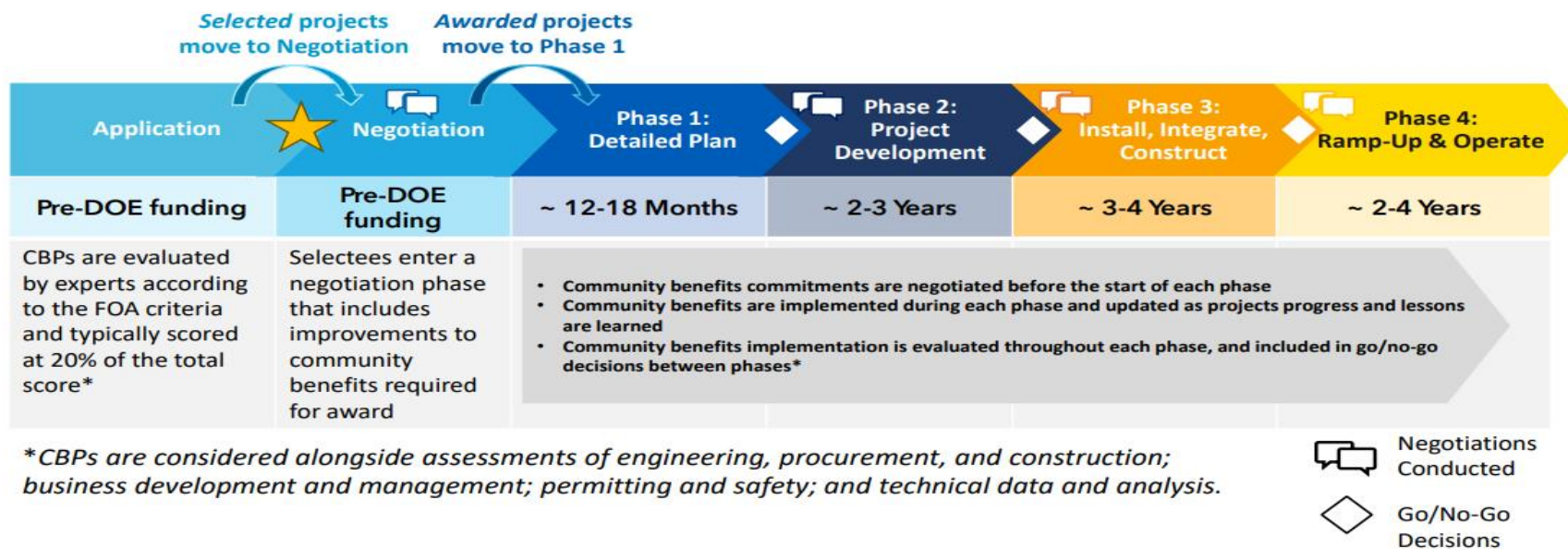
> 25 federal, state, local, and tribal

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H2Hubs and Community Benefits

- ARCH2 will bring a range of positive benefits to disadvantaged and underserved communities throughout the Appalachian region through job creation and addressing environmental and energy justice issues.
- A Community Benefits Plan (CBP), the implementation of which will be overseen by a Community Benefits Advisory Board, will guide ARCH2's engagement with local communities to ensure the economic, social and environmental benefits of ARCH2 will be distributed equitably.



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Community Benefits Plan (CBP)

- The CBP is designed to ensure broadly shared prosperity in the clean energy transition and is based four core policy priorities:
 - Engaging communities and labor;
 - Investing in America’s workers through quality jobs;
 - Advancing diversity, equity, inclusion, and accessibility through recruitment and training; and
 - Implementing Justice40, which directs 40% of the overall benefits of certain Federal investments to flow to disadvantaged communities.

Table 1: CEJST data representation of environmental burdens

Affected State	Total Population	Average Energy Burden Percentage	Average PM2.5 in the air	Current asthma among adults aged ≥ 18 years	Diagnosed diabetes among >18	Coronary heart disease among >18	Average Life expectancy	Average Unemployment Percentage
West Virginia	1,817,305	3.38%	7.63	543,788	685,504	448,470	75.7 years	6.68%
Pennsylvania	12,791,530	3.37%	8.74	3,389,210	3,336,620	2,040,919	78.1 years	5.30%
Ohio	11,655,397	3.24%	9.13	3,205,280	3,682,613	2,121,732	76.6 years	6.03%

J40 Goals to Benefit Communities and DACs



Create a process to continuously update the J40 plan to achieve targets for each policy priority



Update J40 Plan based on Community Priorities



Develop J40 Reporting System to include on ARCH2 public-facing dashboard

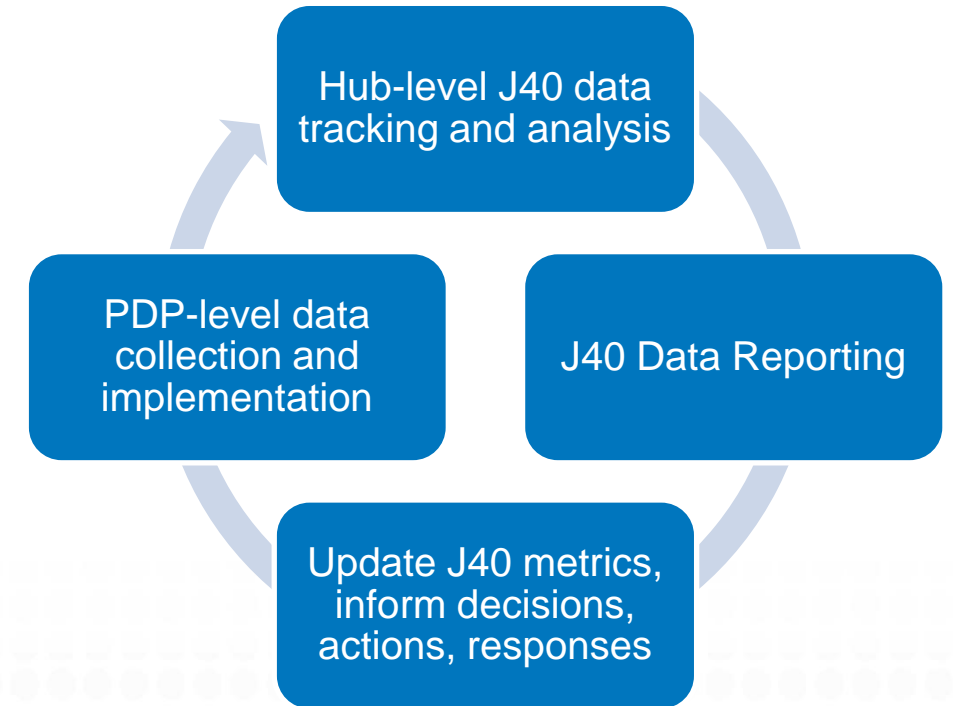


Launch J40 metrics and monitoring systems



Create a J40 database to facilitate tracking progress

High-level J40 data collection, analysis, and reporting



J40 – Defining Who Benefits and How

□ CBP Project Counties

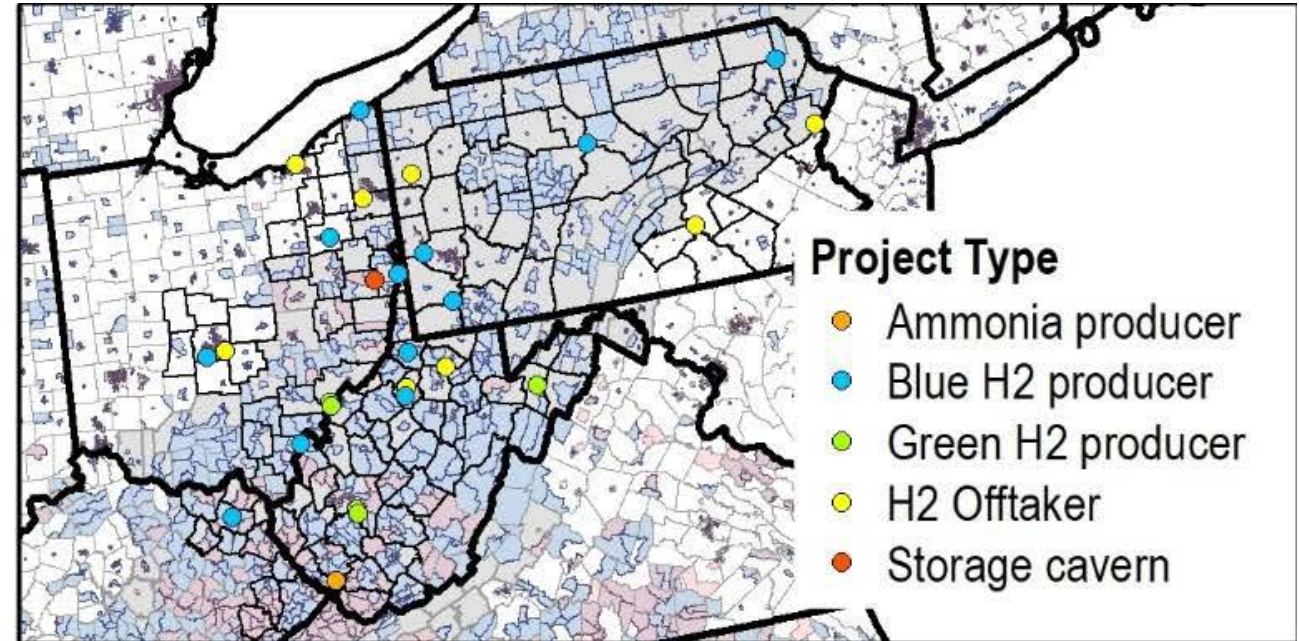
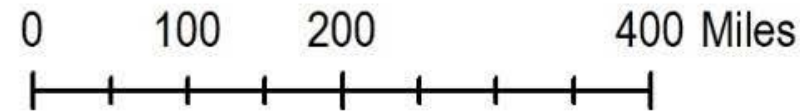
Disadvantaged Community Status

■ Disadvantaged (DOE Energy Justice Dashboard)

■ Disadvantaged (CEJST)

■ Disadvantaged (Both)

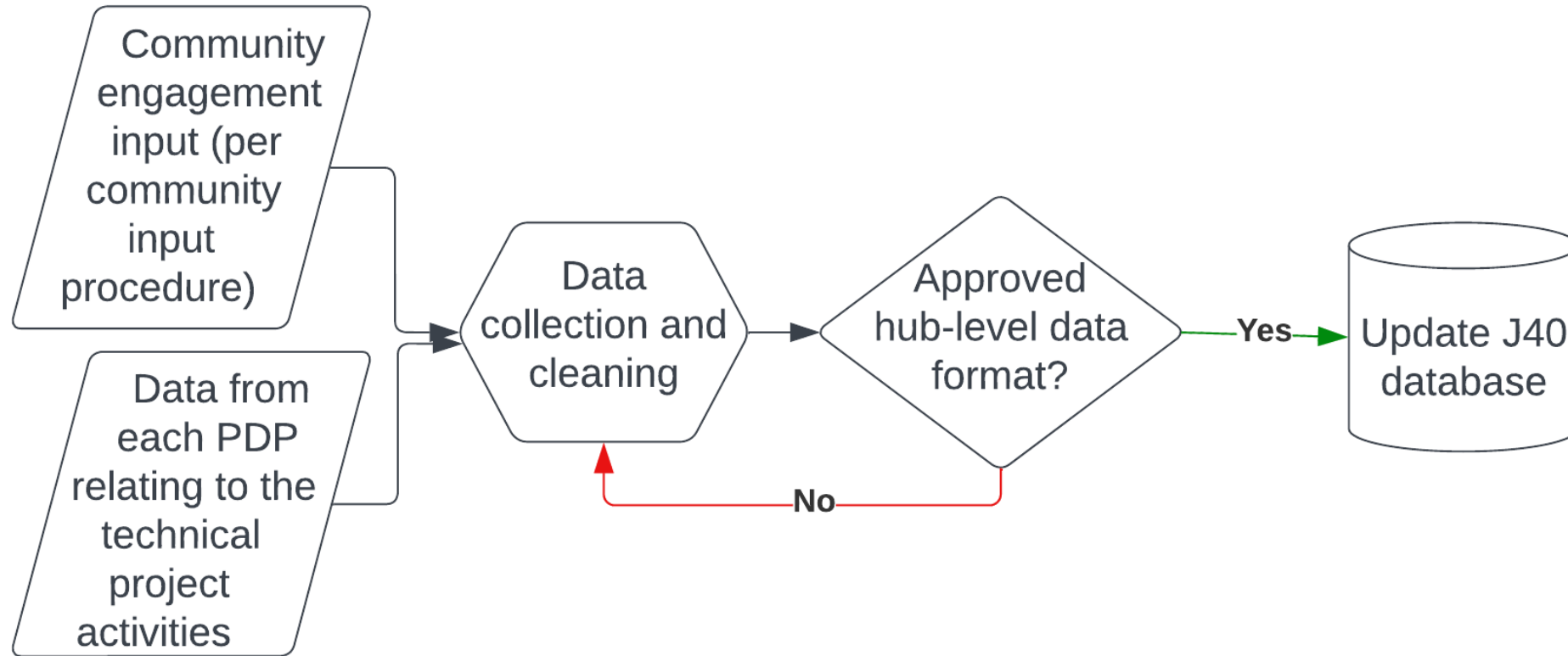
■ ARCH2 Region



- 36% of Census Tracts in in the ARCH2 PMO area are designated as disadvantaged communities (DACs) in CEJST
- Initial J40 metrics will consider existing burdens identified through social characterization and community priorities and needs through early engagement. Examples of the existing burdens identified: PM2.5, Adults ≥ 18 with Asthma, Diagnosed Diabetes, Unemployment

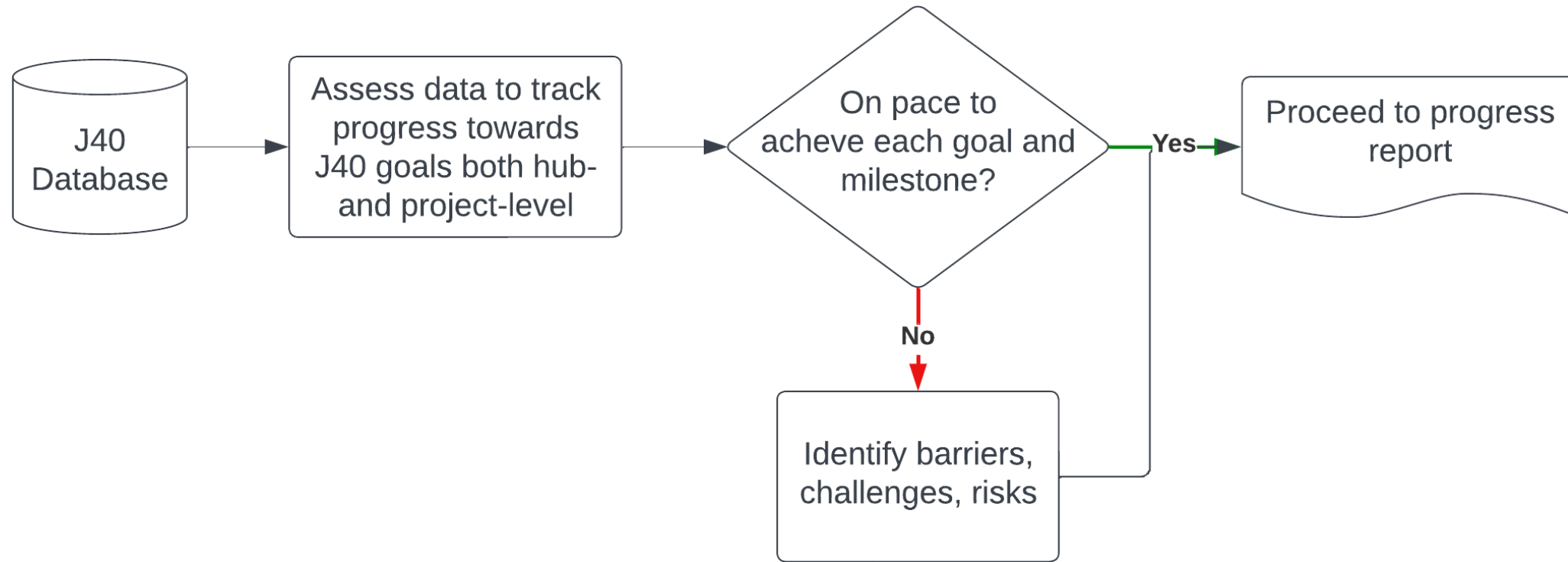
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J40 Process – Data collection for the 8 Policy Priorities across 15 ARCH2 PDPs



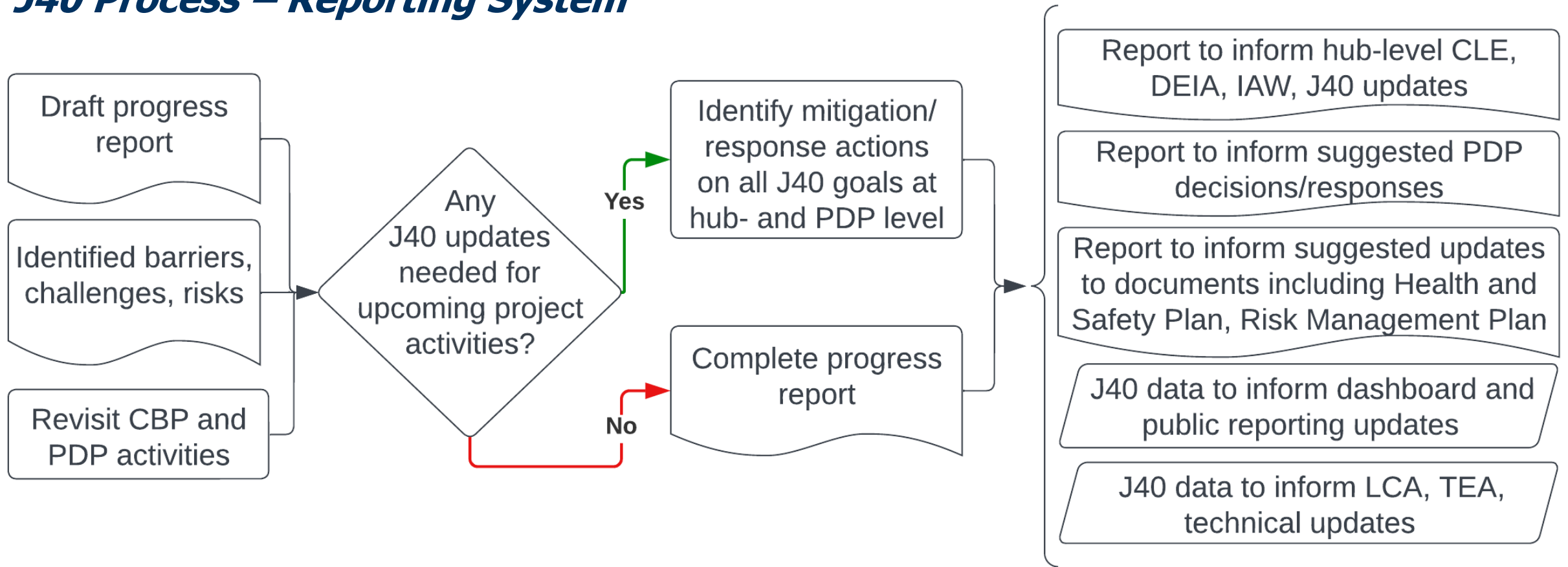
- Process for J40 metrics and monitoring to be informed by community input
- Align project-level metrics in each of the 15 PDP areas with hub-level J40 data metrics
- J40 data to include community priorities, project benefits and impacts, and existing burdens

J40 Process – Data analysis and tracking progress towards goals



- Assess J40 data to track progress towards J40 goals
- Identify any barriers or risks to achieving the goals and milestones
- Re-assess adequacy of metrics, monitoring, and whether additional tools are needed
- Evaluate adequacy of data to respond to community priorities, needs, and PDP activities

J40 Process – Reporting System



- J40 data informs actions taken to mitigate potential negative impacts
- Reporting through two-way communications with communities, community advisory board in each PDP
- Reporting system bolsters strong relationship between PMO, PDPs, and community partners
- Continuous updates to metrics and monitoring at hub and PDP level throughout project timeline

Next steps to develop J40 tracking, reporting, and updating processes, Phase 1

Ensure benefit flows on Policy Priorities across ARCH2 PMO communities, DACs

Update J40 Plan with community priorities and concerns (M3, ongoing)

Update J40 Plan to reflect PDP input (M3, ongoing)

Update community assessment with data and solutions to barriers, risks (P1, ongoing)



Establish processes to track progress towards J40 goals

Data collection (P1, ongoing)

Data analysis (P1, ongoing)

Continuous data reporting and recommendations (P1, ongoing)



Generate data-informed actions and responses at the Hub and PDP level

Develop J40 Reporting System to include on ARCH2 Dashboard (M12)

Launch J40 metrics and monitoring systems (M15)

Facilitate implementation of recommendations across CBP activities, project decisions, responses (P1, ongoing)

Thank you

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