# Non-Pipeline Alternatives

## Emerging Opportunities in Planning for U.S. Gas System Decarbonization

June 17, 2024

# Webinar Housekeeping

- Use the Q&A function throughout to ask questions

- The recording will be shared with registrants

# Agenda

**Intro to NPAs and RMI-National Grid research**

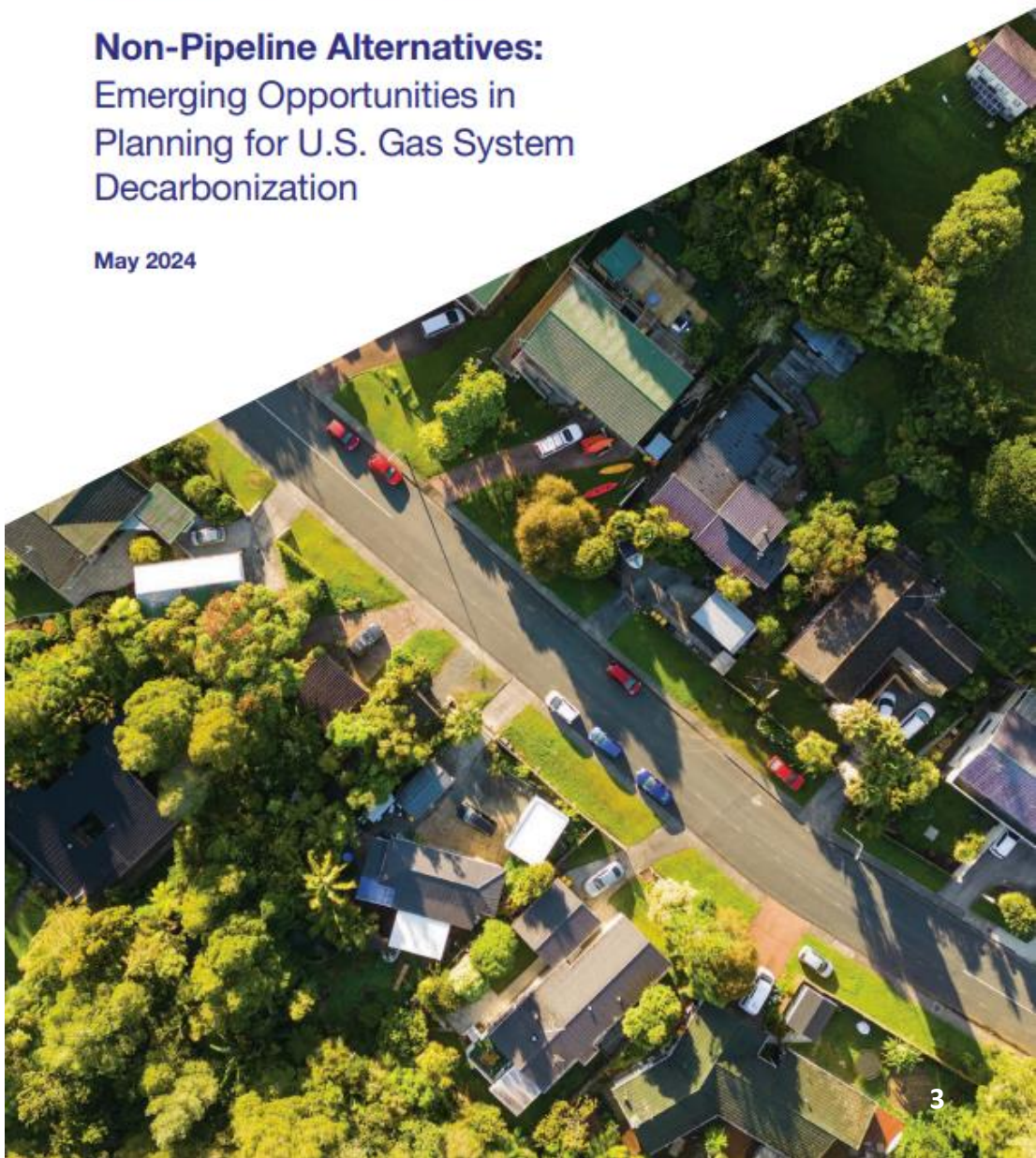
Case studies: National Grid

Case studies: PG&E

Case studies: Europe

Insights & takeaways

Discussion, Q&A



# Non-pipeline alternatives (NPAs)

Projects that

**Reduce** GHG emissions

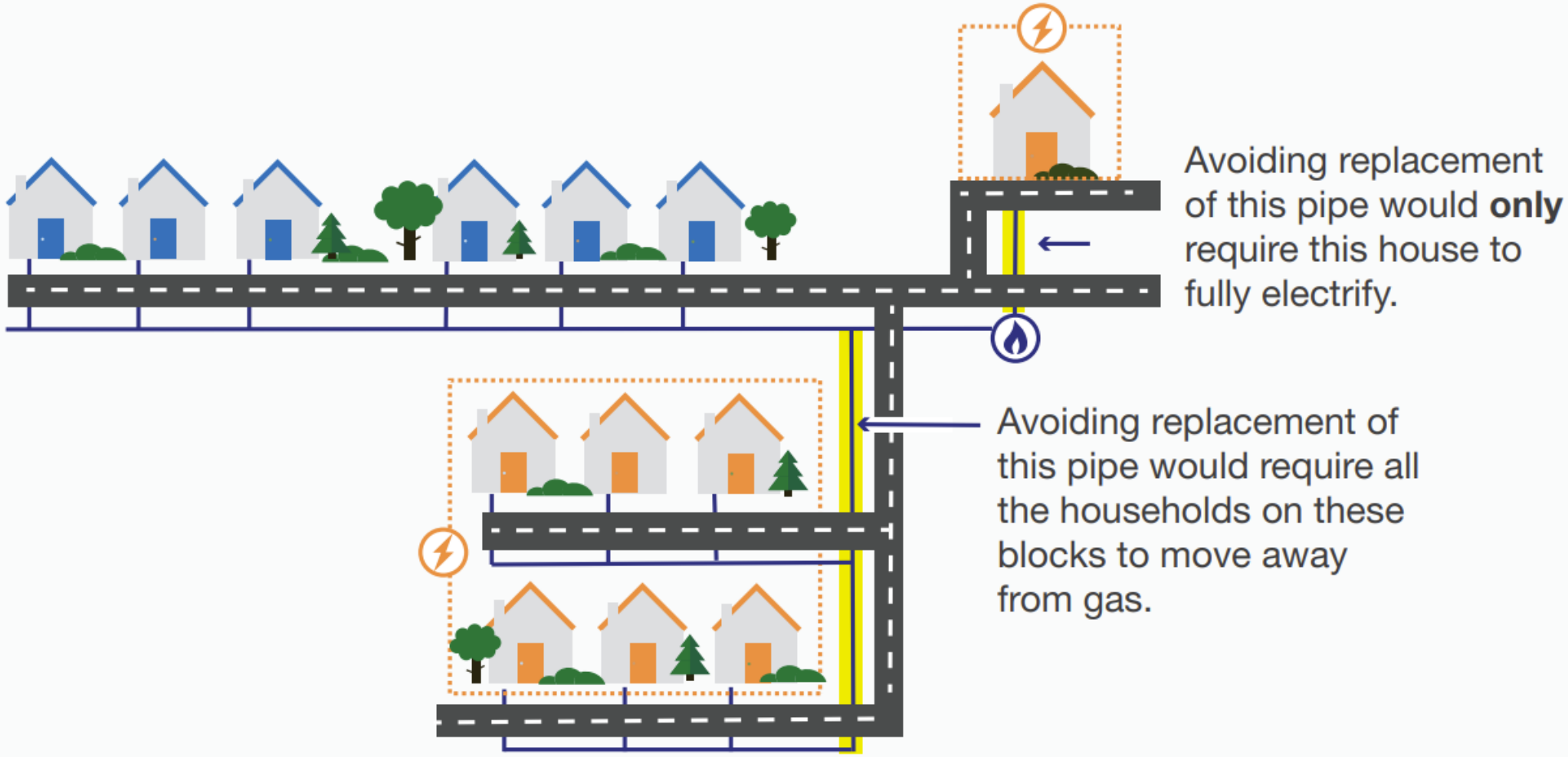
*and*

**Defer**, **reduce**, or **avoid** the need to construct natural gas assets

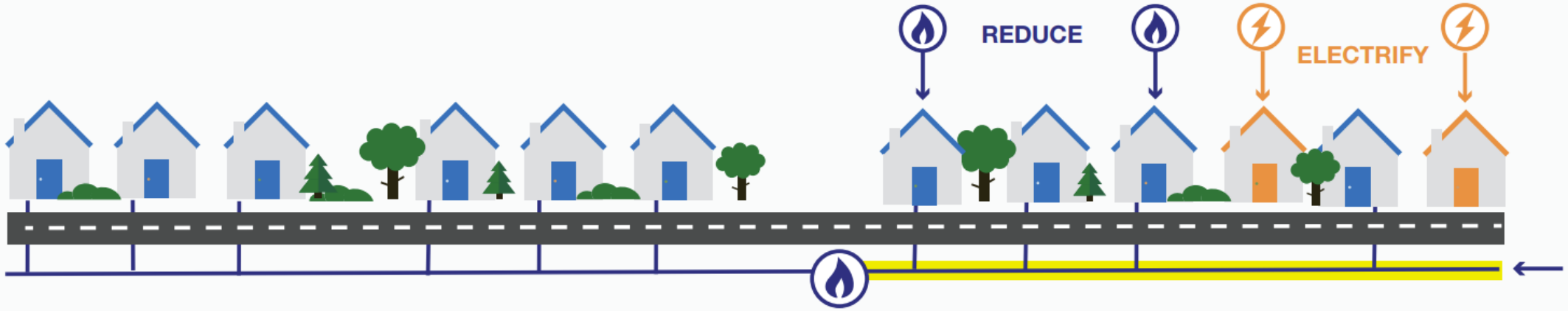
through solutions like

electrification
thermal energy networks
district heating
energy efficiency
demand response

## Avoided replacement

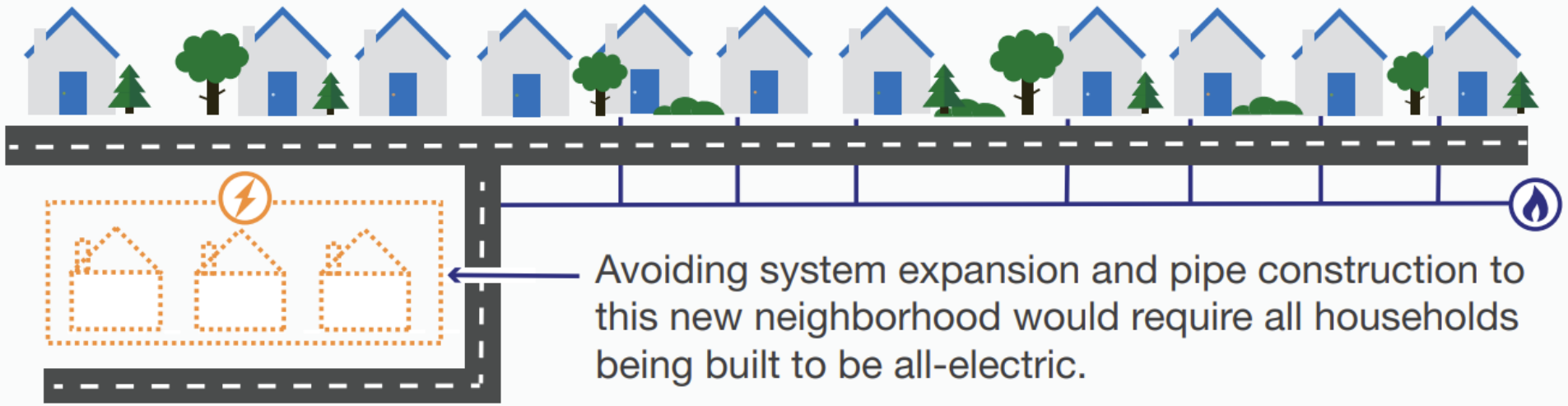


## Avoided capacity expansion

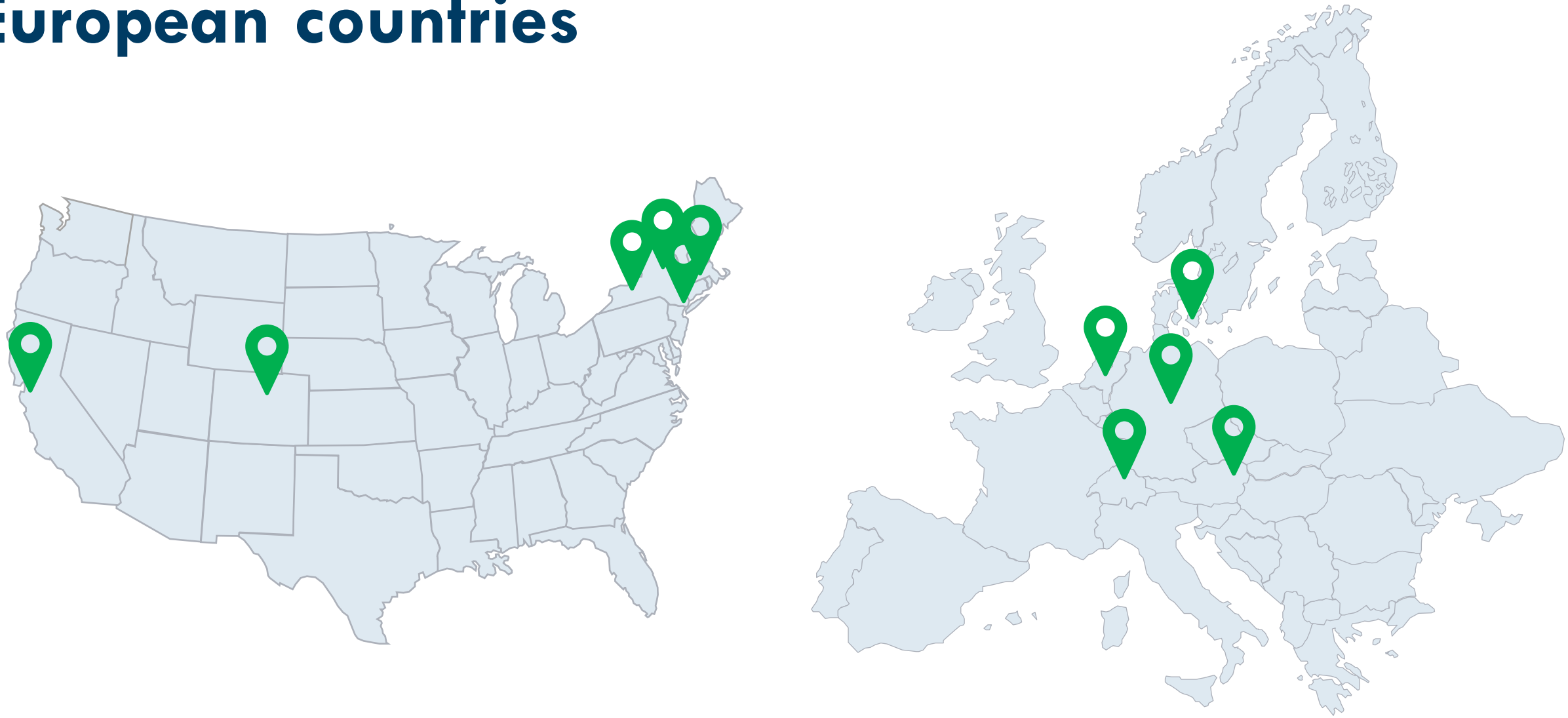



To avoid a capacity upgrade for this pipe, buildings beyond this pipe segment would need to reduce their overall gas demand – this could be through incremental reductions across the group, or full electrification of some customers. This reduction would not require 100% participation of all households.

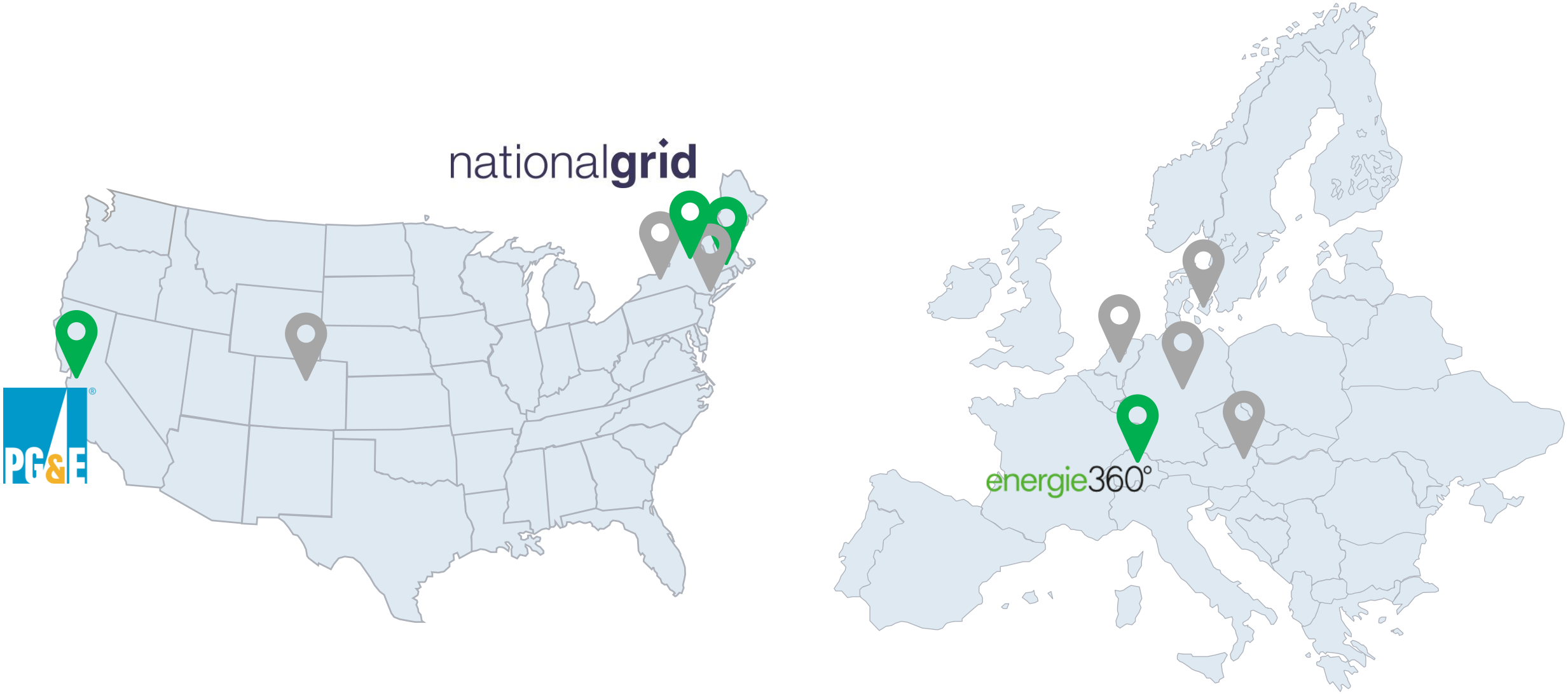
## Avoided system extension



# We saw progress at 5 U.S. utilities and in 5 European countries



# Today we'll highlight three case studies



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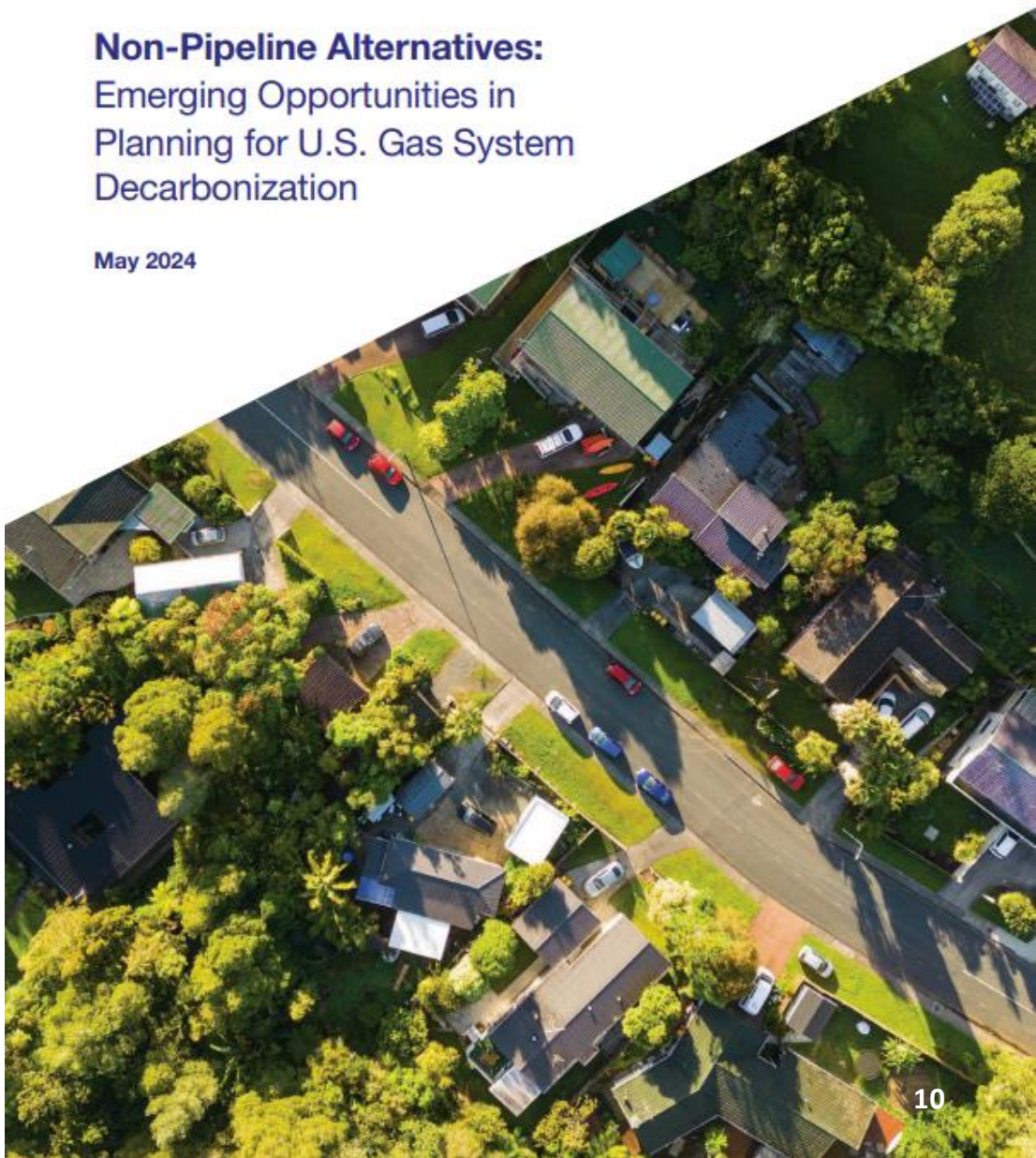

# National Grid's initiatives and experience to date

- Replacement Projects
- Capacity RFPs
- Connections Incentives
- Integrated Energy Planning

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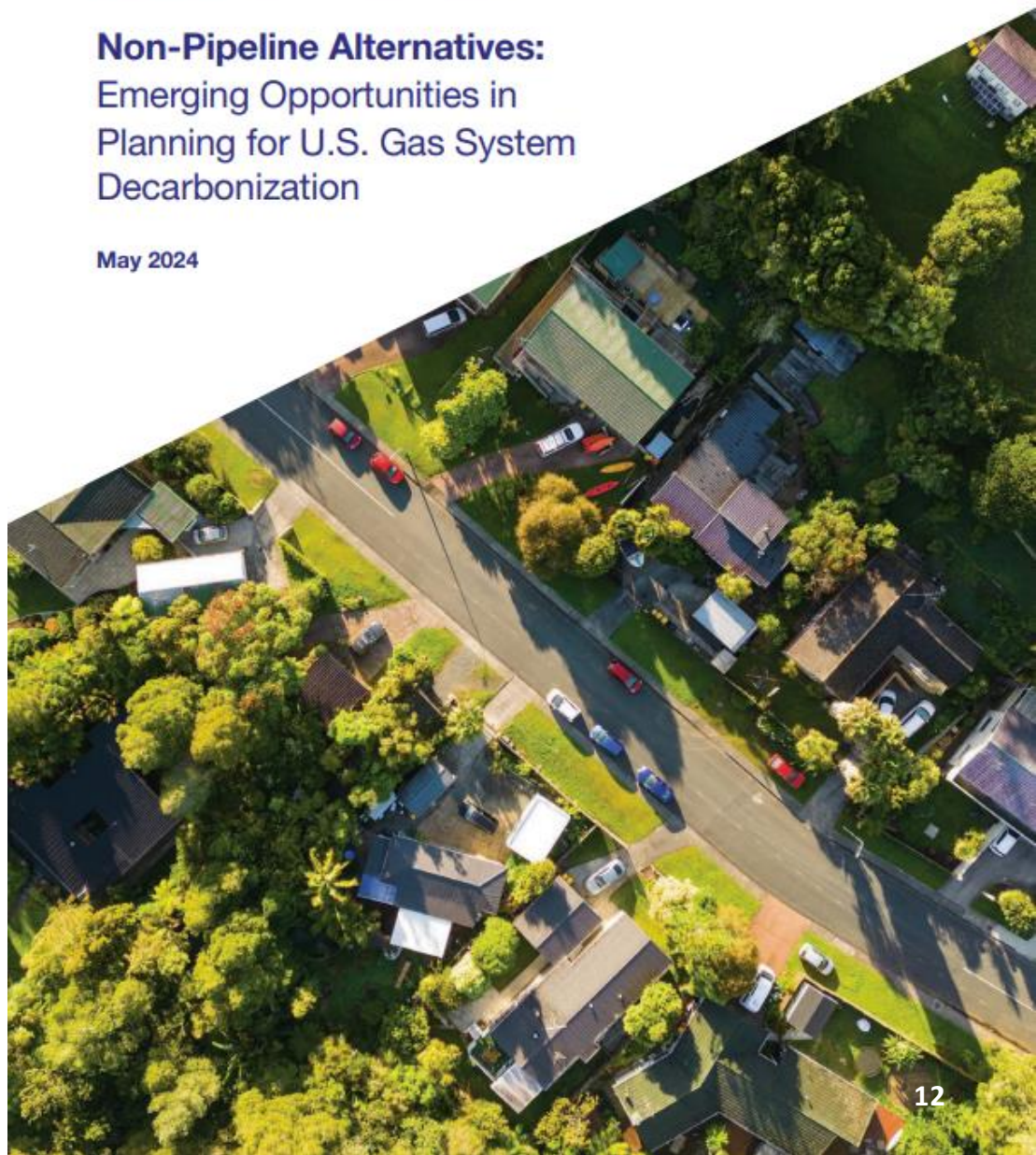
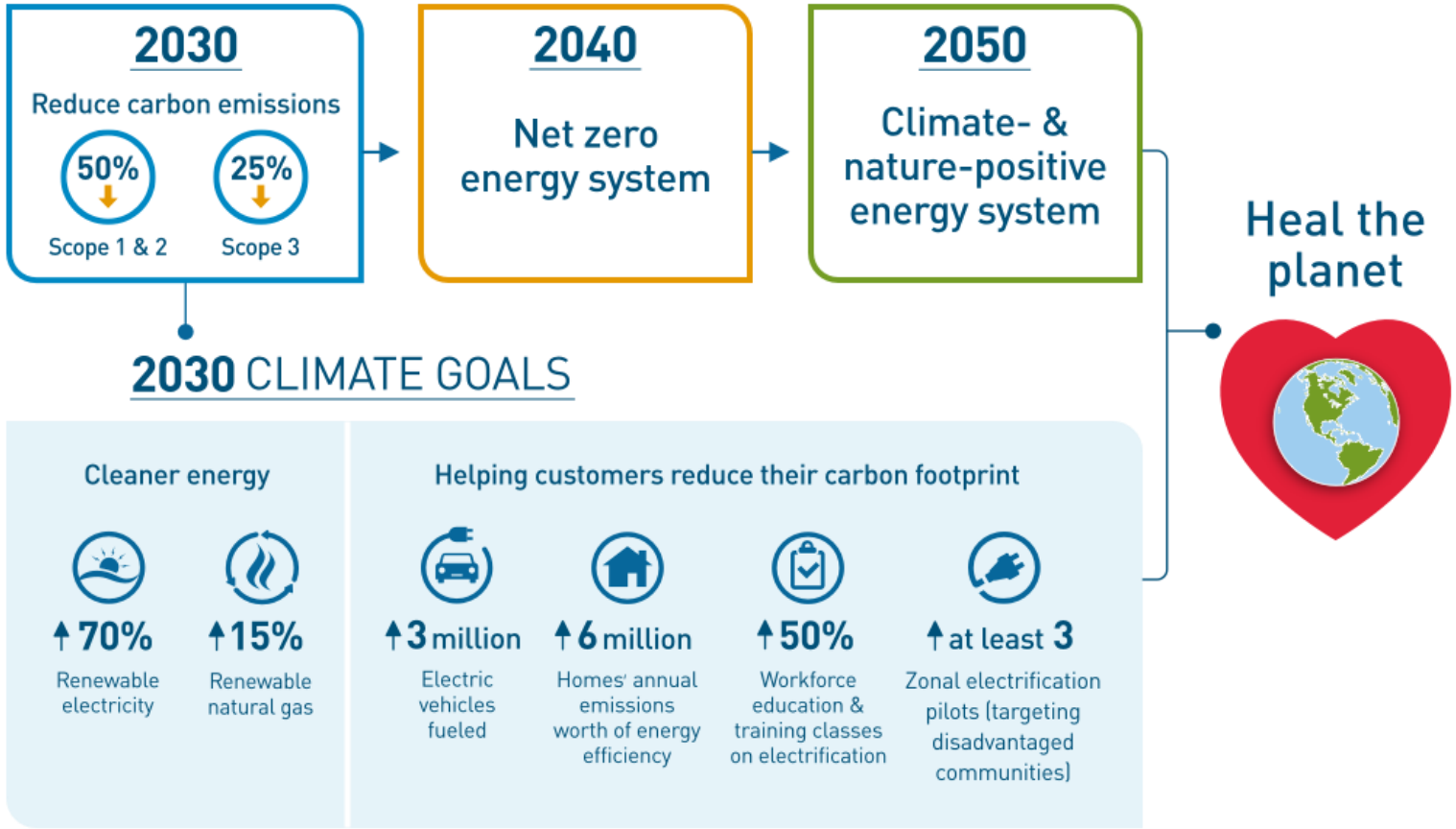


# PG&E Neighborhood Scale Electrification Efforts - Current and Future

# PG&E's Climate Goals




**Notes:**

Scope 1: *Direct* emissions from PG&E's operations.

Scope 2: *Indirect* emissions from facility electricity use and electric line losses.

Scope 3: Emissions resulting from *value chain activities* not owned or controlled by PG&E but that can be indirectly impacted by PG&E actions.

"Scope 4": An emerging term for categorizing emission reductions enabled by a company. PG&E can make a significant contribution by enabling these emission reductions in our service area.

# Targeted and Zonal Electrification

| | Targeted Electrification | Zonal Electrification |
|---|---|---|
| **Motivation** | Geographic electrification and/or retirement of gas assets, with the goal to reduce gas rates through the avoidance/reduction of gas utility spending. | Geographic electrification and/or retirement of gas assets, based on equity, risk, cost savings, etc. |
| **Primary Actors** | Gas utilities | Communities, Regulators, Gas utilities |
| **Scale of Projects** | 1-2 buildings, generally on PG&E's transmission system | 10+ buildings, generally on PG&E's distribution system |
| **How Projects are Funded** | Avoided gas spending | Existing energy efficiency/electrification programs, non-ratepayer dollars |
| **PG&E Example** | Alternative Energy Program | Zonal Equity Electrification Pilot |

# Targeted Electrification – A Cost-Based Approach to Electrification

**Targeted electrification success story: ~2,000 ft Aldyl-A replacement project**


| | Status quo gas replacement | Electrification alternative |
|---|---|---|
| Pipe replacement/retirement | $1.2M | $20K |
| Customer electrification | - | $130K |
| Service retirement | - | $6K |
| **TOTAL** | **$1.2M** | **$156K** |

## Progress to Date

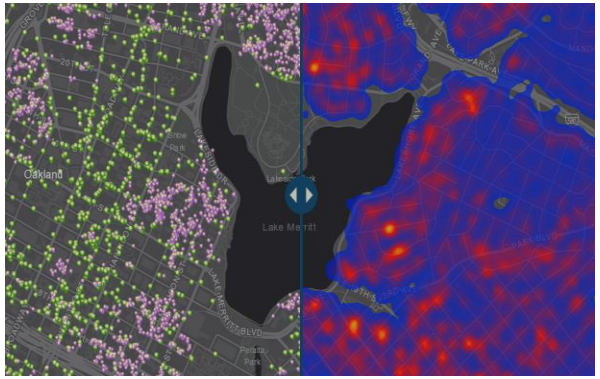
- PG&E's Gas Investment for the Future (GIF) team evaluates alternatives to gas investments and engaged customers on alternatives to gas service.
- Small-scale projects conducted to date have electrified 102 customers, avoided 80 high-pressure regulator rebuilds and 4.2 miles of distribution main, while enabling the retirement of 22 miles of line.
- On August 10th 2022, PG&E filed an application with the CPUC that asks for up to $17.2 million to pursue targeted electrification at CSU Monterey Bay. Costs of the project would be fully offset by the savings of not having to repair the gas line.

## Scaling Early Success

- Scale is dependent on changes to "obligation to serve", external funding, and ability to capitalize behind-the-meter electrification costs.
- Utilities need a streamlined application process for targeted electrification projects to ensure that they can be conducted on a timeline consistent with critical gas safety and/or reliability needs.

# Zonal Electrification: Increased focus on Emissions and Equity

The Geospatial Electrification Tool has various data layers to assess electrification potential of a given geographic area


## Progress to Date

- Developed an internal *Geospatial Electrification Tool* to evaluate potential areas for zonal electrification. The tool includes data such as customer income, prevalence of renters, geographic risks, and electric capacity
- PG&E provides a high-level version of this tool, under NDA, to local governments to allow collaboration on planning efforts
- Submitted a zonal electrification program, targeting low-income neighborhoods, in PG&E's 2023-2027 energy efficiency portfolio

## Scaling Early Success

- Similar to targeted electrification "scale is dependent on changes to 'obligation to serve', [significant] external funding, and ability to capitalize behind-the-meter electrification costs"
- Building networks of local, trusted partners is needed to support customer acceptance for community-led electrification

# Geospatial Electrification Tool Scores

Current Cost Optimization

Equity Optimization

Future Cost Optimization

Emissions Optimization

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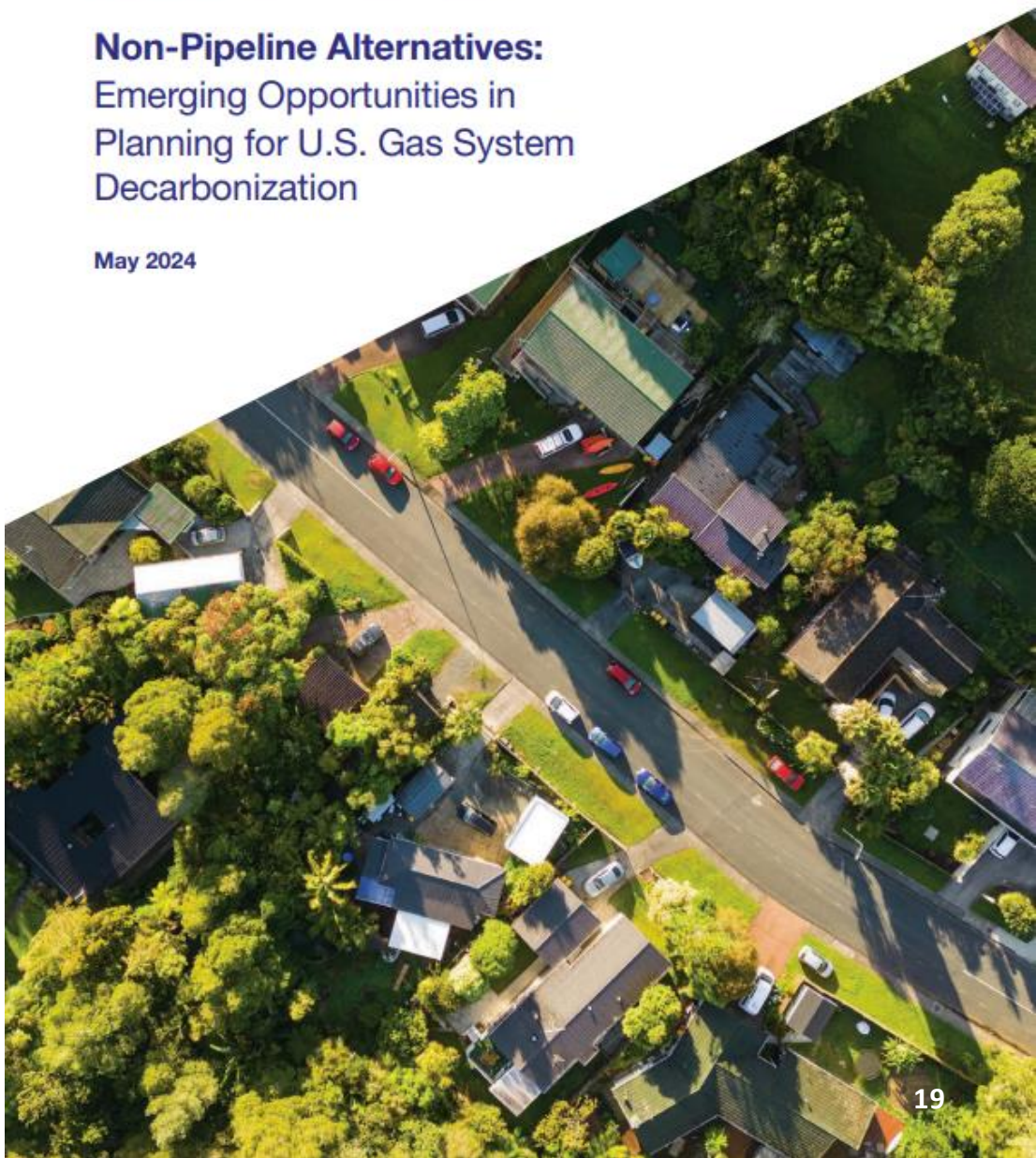
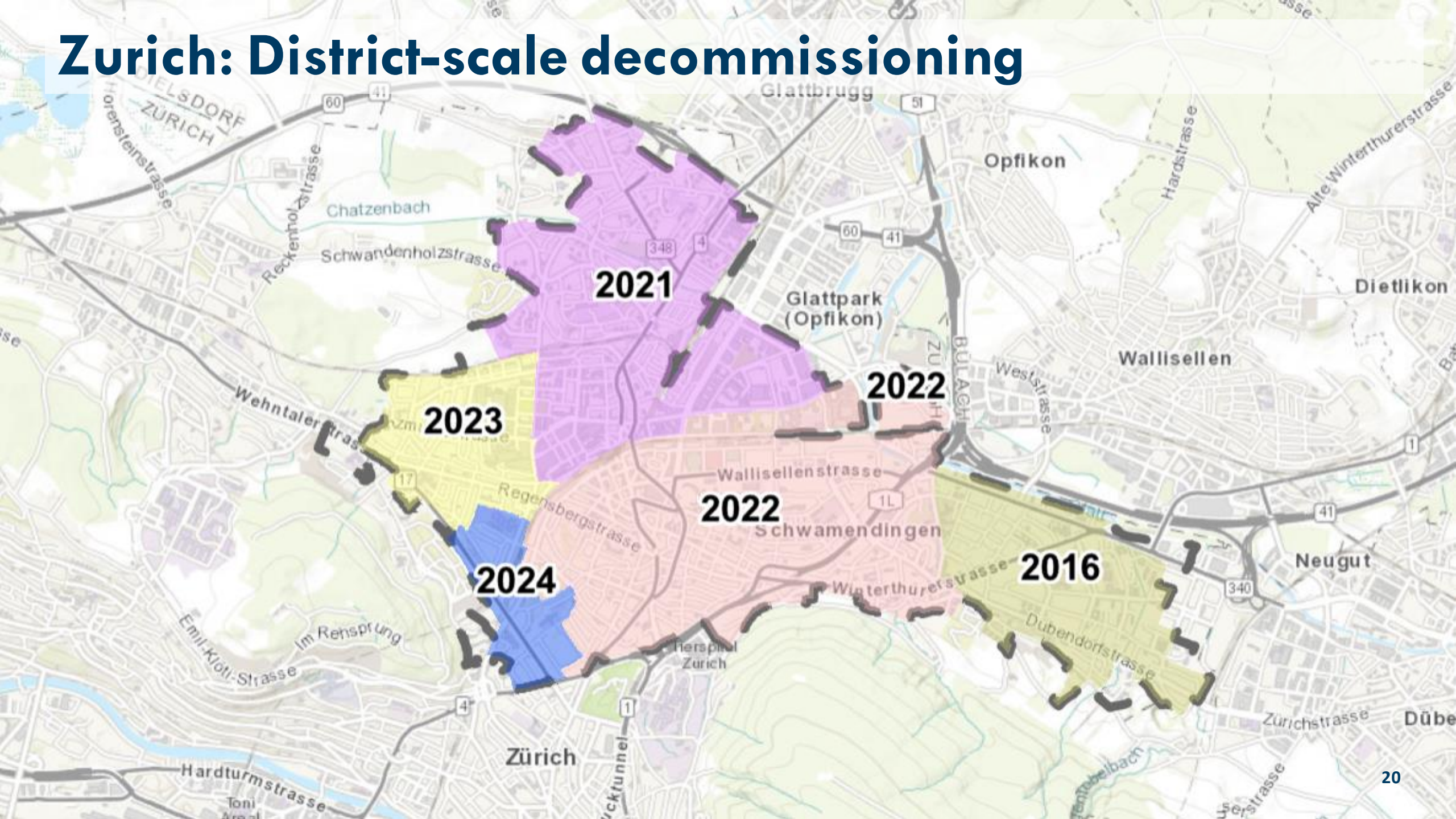
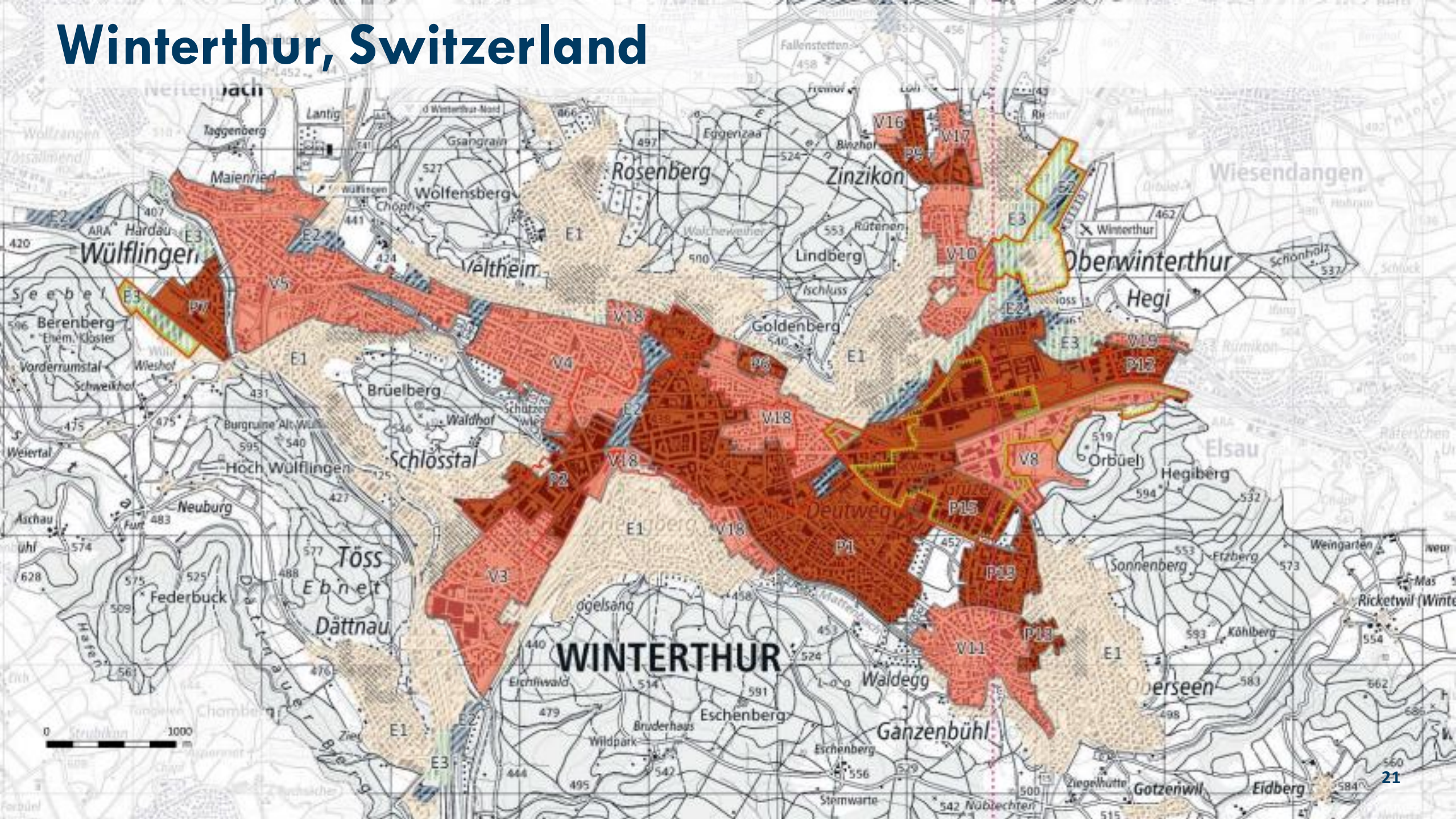


# Zurich: District-scale decommissioning



# Winterthur, Switzerland



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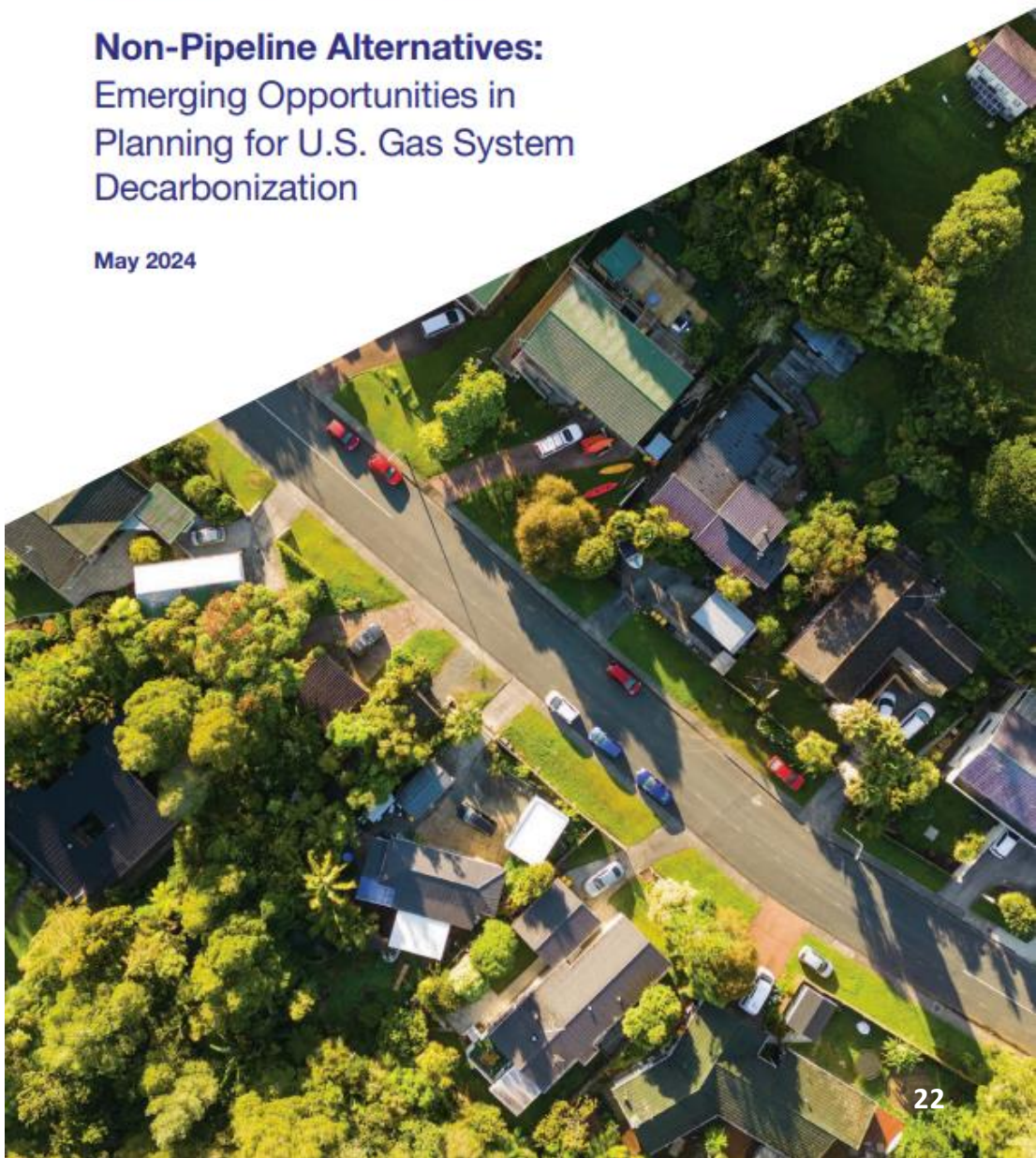

# Themes across case studies

- Diverse goals
- Integrated planning
- Project benefits
- Municipal partnership
- Project prioritization
- Customer engagement
- Funding
- Policy

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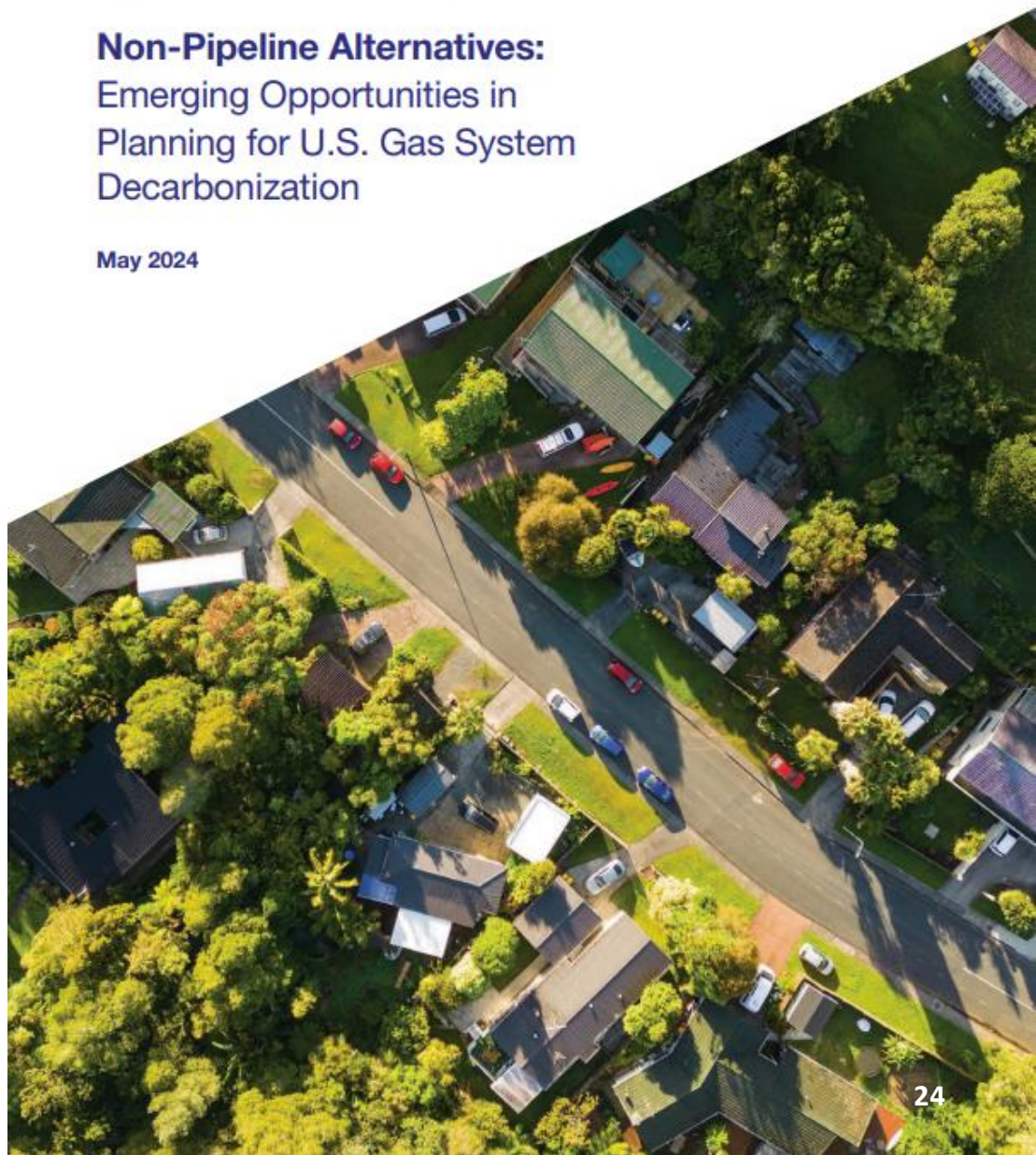

# Contacts

Mike Henchen
mhenchen@rmi.org

Karsten Barde
karsten.barde@nationalgrid.com

Rachel Kuykendall
rachel.kuykendall@pge.com