Getting Natural Gas to Perry County Businesses: The "Virtual Pipeline" Approach

PERRY COUNTY PCEDA ECONOMIC DEVELOPMENT AUTHORITY

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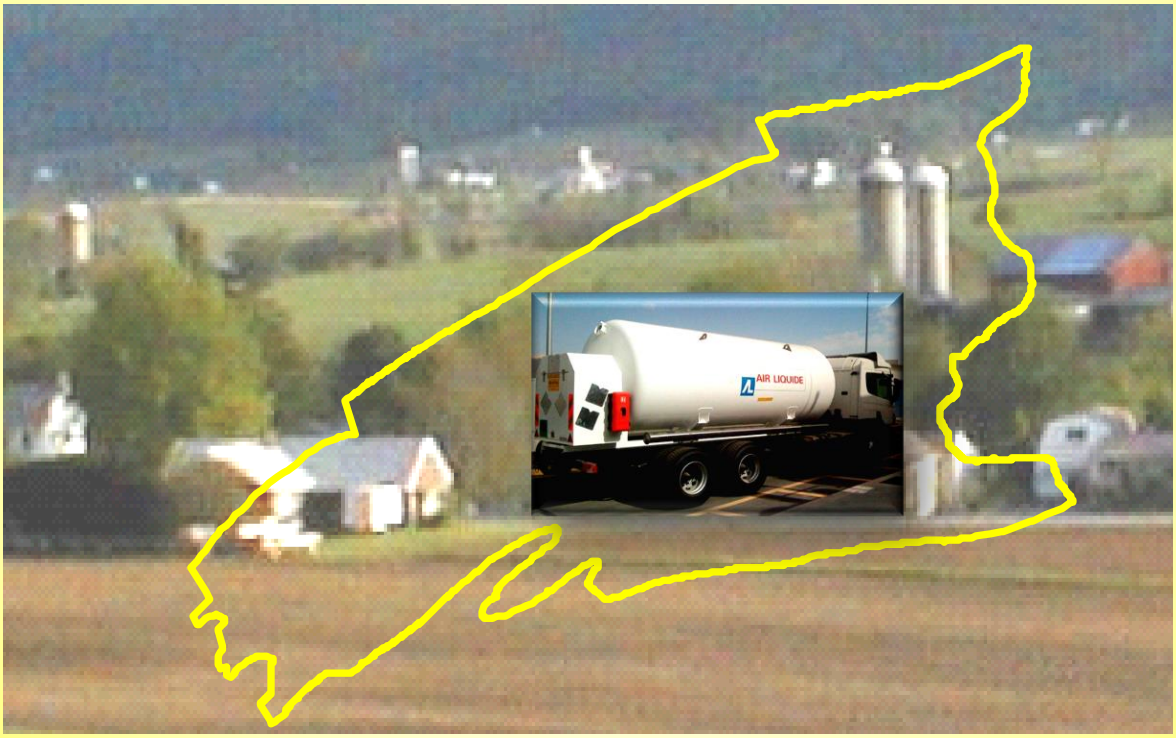
SEDA-COG NATURAL GAS COOPERATIVE, INC

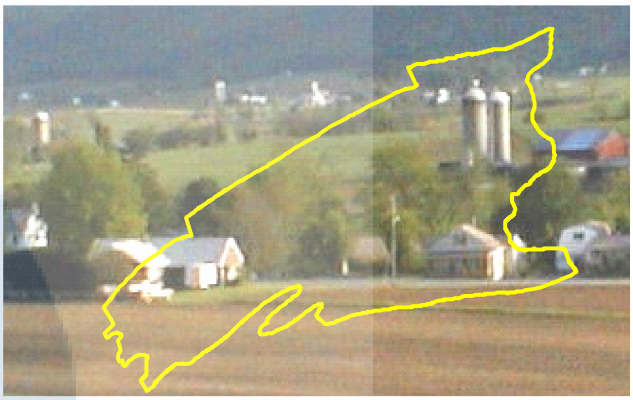


Can my business in Perry County get natural gas?

The answer is
"YES!"

Natural Gas and "Virtual Pipelines"

Natural gas is one of Pennsylvania's most significant resources that promotes economic vitality and growth for its businesses and citizens. But natural gas isn't readily available in too many places in Perry County via hardline pipeline delivery systems. And building new delivery pipelines is expensive and can be environmentally challenging. How can this situation be improved?



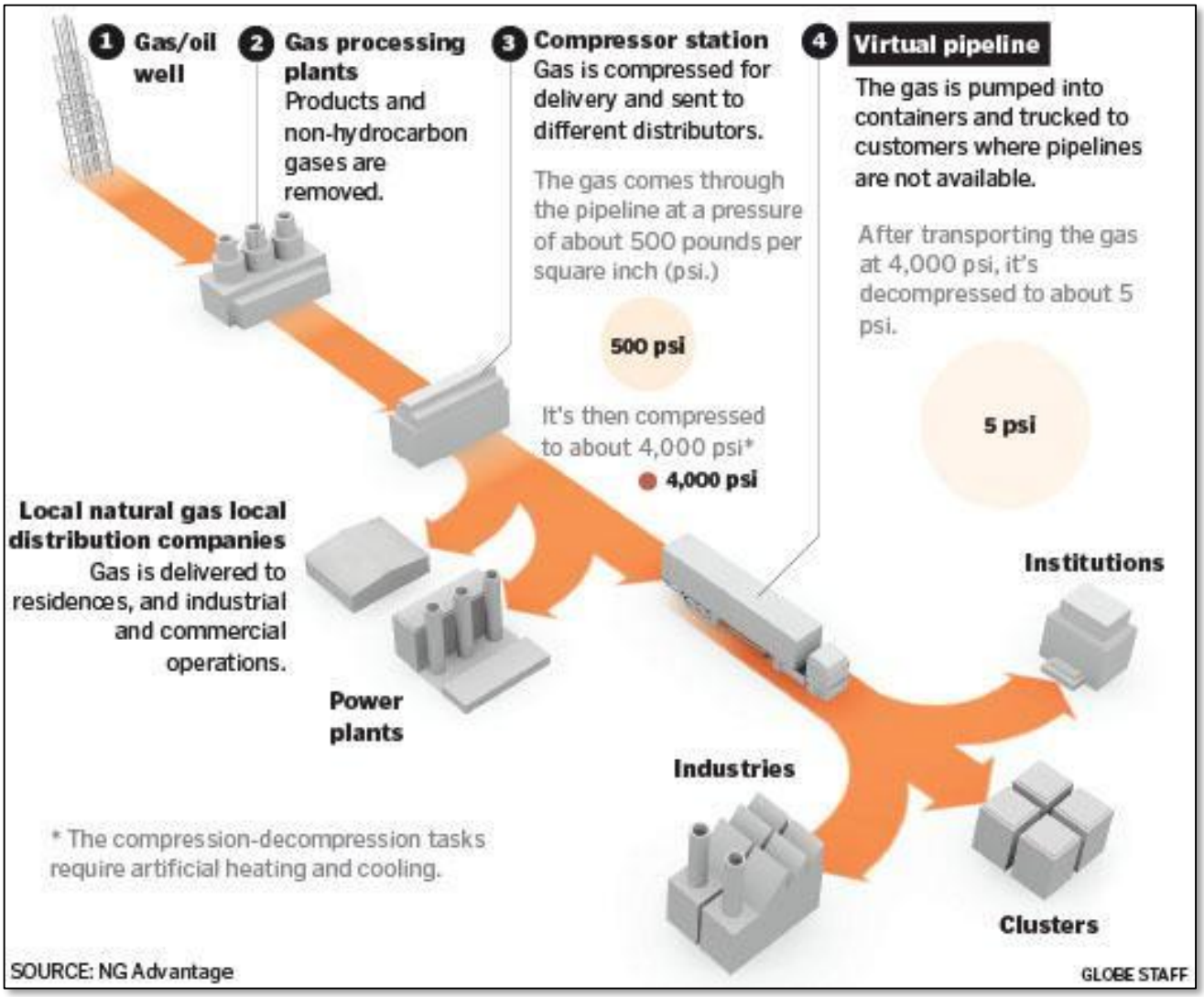
A timely and attractive solution to get natural gas to Perry County is through **"virtual pipelines"**. This is a method for delivery by vehicle of compressed natural gas (CNG) or liquefied natural gas (LNG) to customers. The SEDA-COG Natural Gas Cooperative is working with central Pennsylvania companies to promote delivery of **Pennsylvania natural gas** via this method.

Virtual pipeline and natural gas delivery to Perry County businesses has several main advantages. It is:

- The best natural gas solution for rural areas
- Scalable and suitable for small- to large-size businesses
- Cheaper and more environmentally friendly than many other commonly-used energy sources
- Quicker and lower cost to implement as compared to pipelines
- Safer than transmission pipelines - there's little infrastructure required, and no below-ground pipelines are needed, although limited standalone distribution pipeline networks can be supported

Virtual Pipelines: How They Work

Virtual pipelines enable customer delivery of liquefied natural gas (LNG) or compressed natural gas (CNG) by vehicle. This model is gaining popularity for medium- and large-size businesses, especially in rural areas of the Northeast. It is suitable for a single standalone customer or a network of customers linked by a standalone delivery pipeline. Double-walled cryogenic storage tanks are available in many sizes, can be vertical or horizontal, and can be scaled up or implemented in a multiple-tank configuration.



Virtual pipeline delivery overview

Virtual Pipelines: Infrastructure and Example Delivery Scenario

LNG liquefaction plant

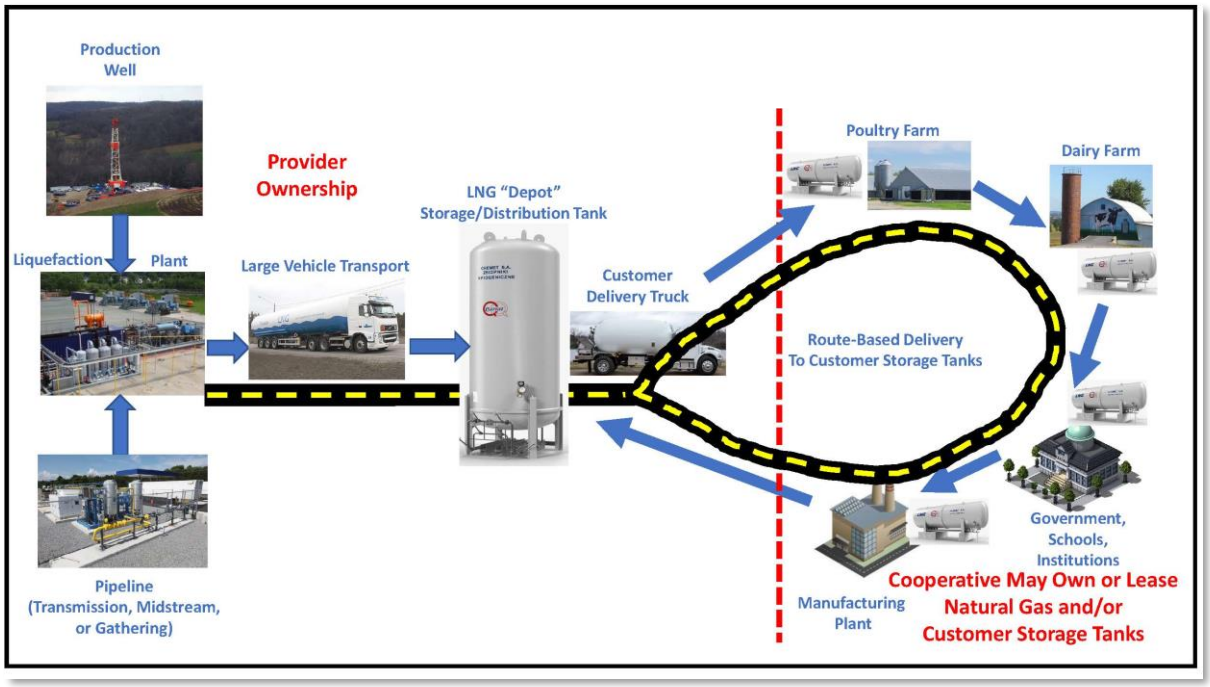
CNG compression plant

LNG delivery truck

CNG delivery truck

LNG storage tank

CNG customer delivery pad



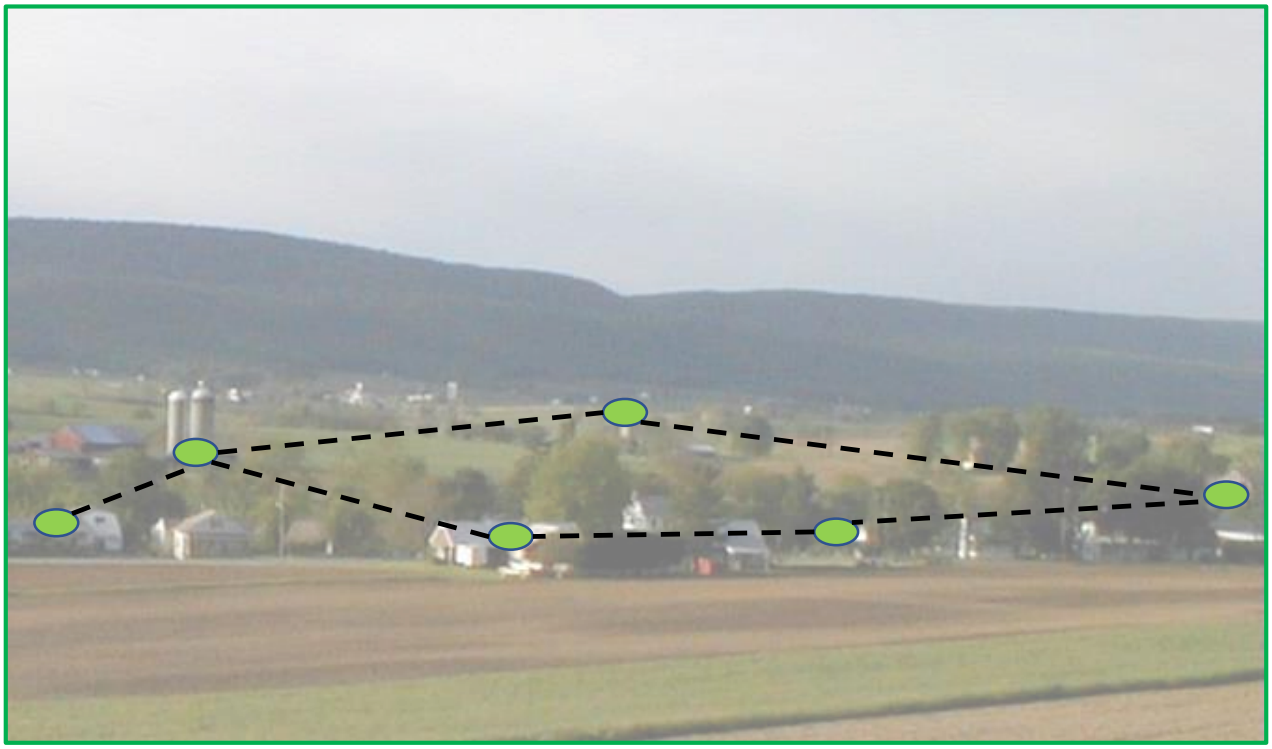
Example route-based delivery scenario for multiple sites

Virtual Pipelines Spotlight: Agriculture-Related Businesses

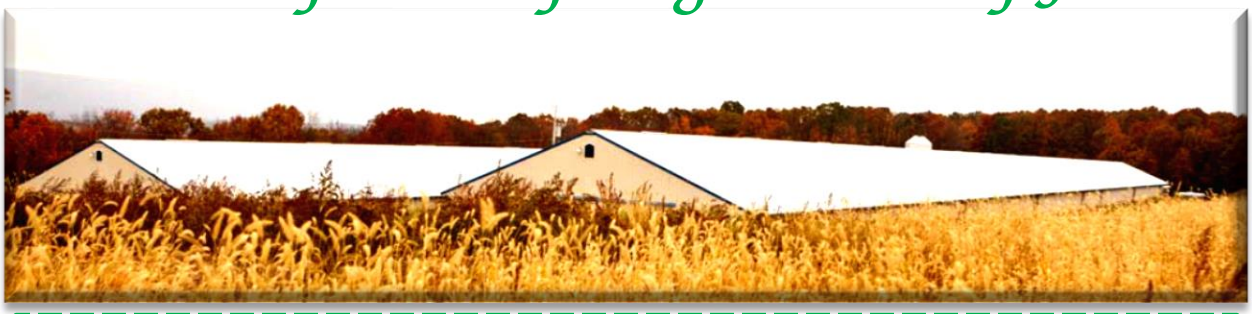
Virtual pipeline solutions are especially attractive to businesses in the agricultural sector. especially for route-based delivery of LNG. In this scenario, LNG can be delivered by truck to customer storage tanks located along a route.

Some types of agricultural industries that can most benefit from using natural gas include:

- Food processors
- Grain dryers
- Cheese processors
- Poultry, dairy, and swine farms
- Forest product industries
- Greenhouses
- Hardwood processors, including:
  - Modular home and furniture/cabinet manufacturers
  - Pallet manufacturers
  - Sawmills
  - Prefabricated wood building manufacturers



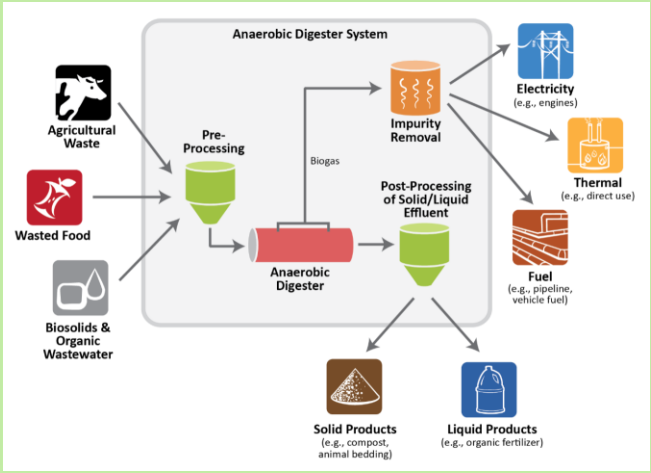
Virtual Pipelines Spotlight: Poultry Farms



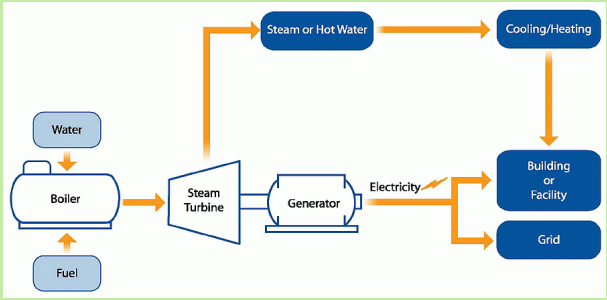
Poultry farms are an energy-intensive type of business that contribute significantly to central Pennsylvania's economy and employment base. According to the U.S. Census of Agriculture (2012 data), the 8-county area including Centre, Clinton, Juniata, Mifflin, Montour, Northumberland, Perry, and Union have over 220 poultry farms, many of which have multiple broiler houses. Most broiler houses run several cycles of raising chicks over one year's time, and use propane to heat the barns. Conversion of propane heating to natural gas is relatively straightforward and simple, and delivery piping can typically be reused. A single on-site LNG storage tank can be connected to and serve multiple broiler houses. This setup is ideal for being served on a regular basis by trucks that provide LNG via a regular delivery route to multiple customers located in close proximity.

Virtual Pipelines Spotlight: Combined Heat & Power (CHP)/ Cogeneration

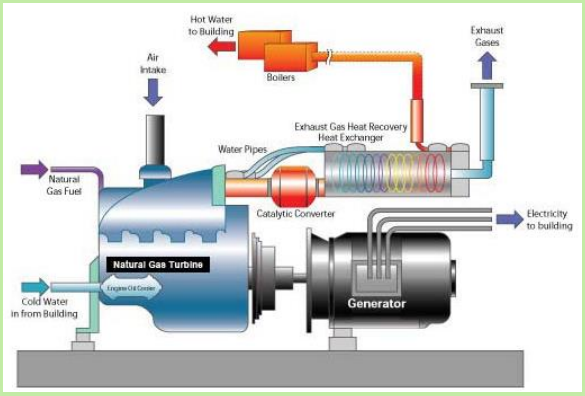
Combined heat & power (CHP)/cogeneration energy solutions are important to businesses who can recover waste or excess thermal heat generated by energy generation processes, and reuse it or export it back into the local energy grid. Many large industrial installations have a CHP/cogeneration capability that uses natural gas turbines, such as power stations, paper and pulp mills, chemical processors, and oil refineries, and CHP/cogeneration may also be suitable for smaller agricultural businesses. Anaerobic digesters produce combustible methane gas from anaerobic digestion of biological material, such as manure, and are being increasingly used as CHP/cogeneration renewable energy solutions on a nationwide basis. Natural gas systems can be a central part of this solution. Major benefits of combined heat & power (CHP)/cogeneration energy solutions include significant reductions in carbon emissions, and long-term energy cost savings.



Source: tn.gov



Combined heat & power system design
Source: epa.gov



Cost Savings and Funding Support for Virtual Pipeline Implementations

Delivered natural gas in LNG or CNG form offers cost savings as compared to propane, heating oil, electricity, and other energy modes. Investment in on-site delivery infrastructure can be financed over time, and grant and loan programs from the state of Pennsylvania and federal agencies are available. Funding support for virtual pipeline projects has been provided in the past few years through several state and federal agencies, including those shown below. For its projects, the SEDA-COG Natural Gas Cooperative has received project grant funds from the state's Pipeline Infrastructure Program, the U.S. Department of Agriculture, the U.S. Economic Development Administration, and the Appalachian Regional Commission. In addition, SEDA-COG can provide staff support for grant and loan applications, accessing revolving loan funding, and managing grants.

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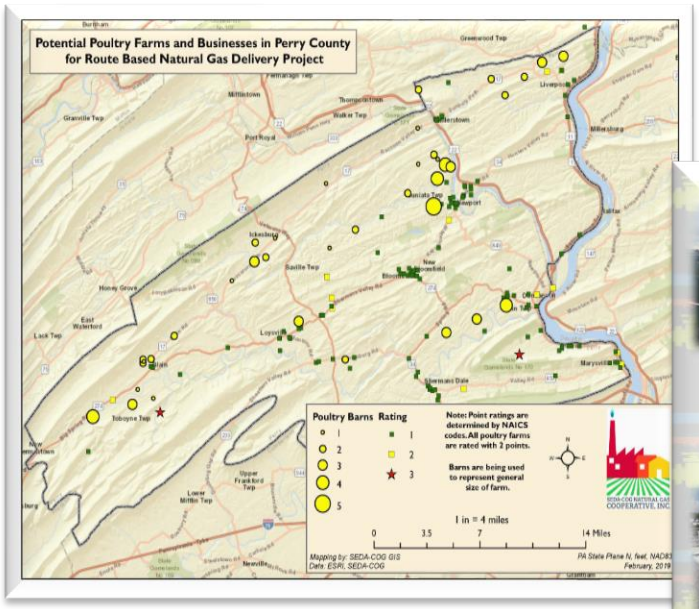
Working with Perry County and the SEDA-COG NG Cooperative to Get Natural Gas

SEDA-COG NATURAL GAS COOPERATIVE, INC

The SEDA-COG Natural Gas Cooperative, which covers 8 member counties including Perry, has a successful, growing track record of working with partners, to receive project funding, including for virtual pipeline projects. Cooperative staff can conduct project studies and analysis, perform cost feasibility evaluations, and prepare and submit grant applications.

We also have developed a project cost analysis tool that incorporates factors to evaluate potential virtual pipeline projects. These factors include:

- Number and Capacity of Tanks
- Current Annual Energy Usage and Costs
- New or Used Tanks
- Tank Costs
- Grant Availability
- Financing Scenarios
- Projected Customer Savings



For more information on getting natural gas to your business, contact us!

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