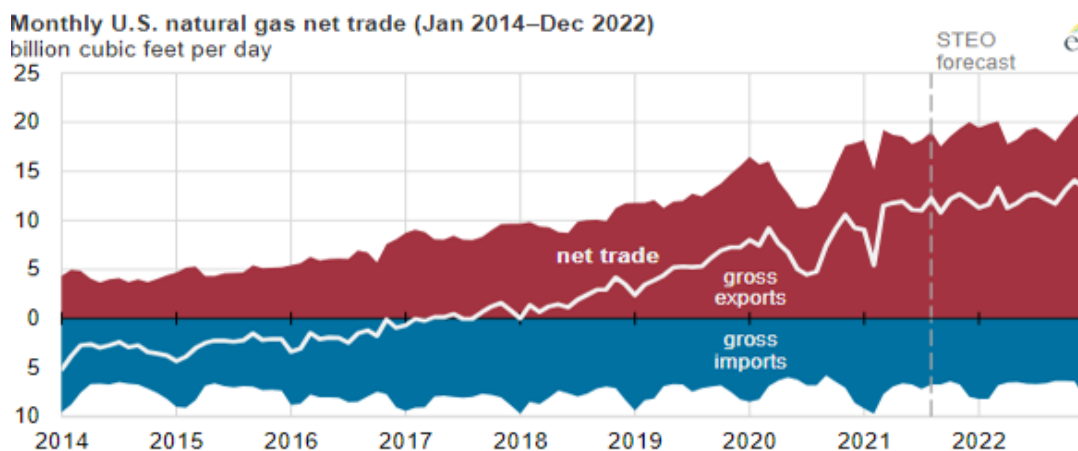


Energy Transition Opportunities: North American LNG

This quarter, let’s dive into the changes in the energy space that are likely to occur over the next few years. By the middle of this decade, we will likely be into the next phase of potentially lower global carbon emissions with the continued replacement of higher emission energy (coal) with lower emission options (natural gas). We will likely see North America solidified as a global cleaner energy exporter and energy independence also may occur within this timeframe. We believe there are plenty of investment opportunities within the energy space that will help the world reach this next phase, but patience is required.

First, a little history. Approximately a decade ago, North America (predominately the U.S.) was a Liquefied Natural Gas (LNG) importer, until the evolution of shale drilling technology was established, which unlocked stranded oil and natural gas resources. Unlocking these stranded resources became known as “the shale revolution” and benefited the U.S. This revolution is now transitioning towards shaping global energy infrastructure policy/strategy with the potential benefit of lowering global carbon emissions – a win/win situation. With the U.S. establishing its first LNG exports in 2016, it has now become a top three global exporter in just eight years. Additionally, since 2005, the U.S. has transitioned the majority of its coal powered electrical generation to natural gas and renewables. Natural gas accounts for ~61% of total emission reductions from coal plant phaseouts, not to mention that natural gas production grew from ~65 billion cubic feet per day (bcf/d) to over ~102 bcf/d or 56+% growth – yet another win!

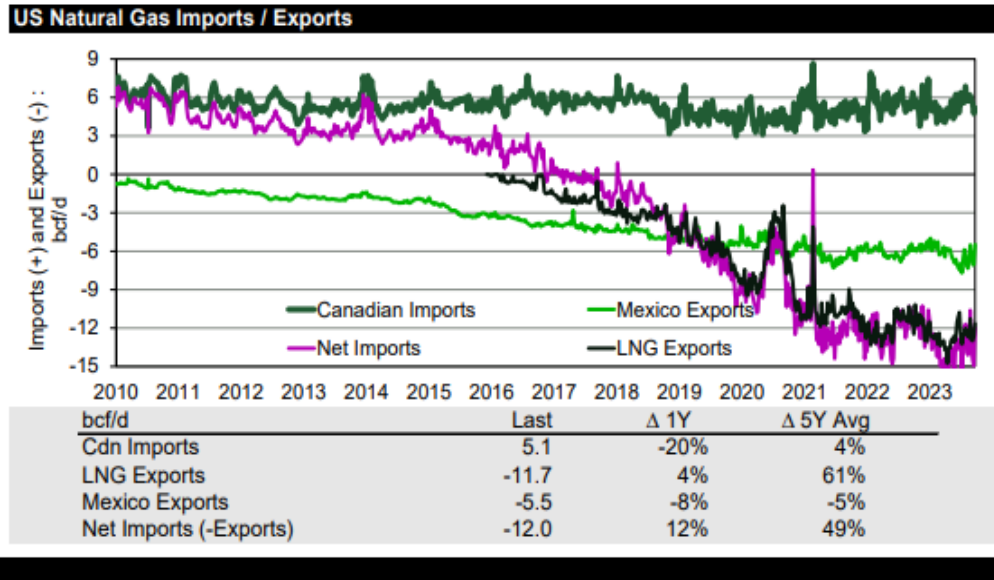
U.S. Natural Gas Net Trade is Growing as Annual LNG Exports Exceed Pipeline Exports



Source: U.S. Energy Information Administration, Short-Term Energy Outlook.

Today’s North American natural gas environment is outlined in the following chart, with Canada exporting ~5-6 bcf/d to the U.S. The U.S. in turn exports ~6 bcf/d to Mexico and ~12.5bcf/d globally.

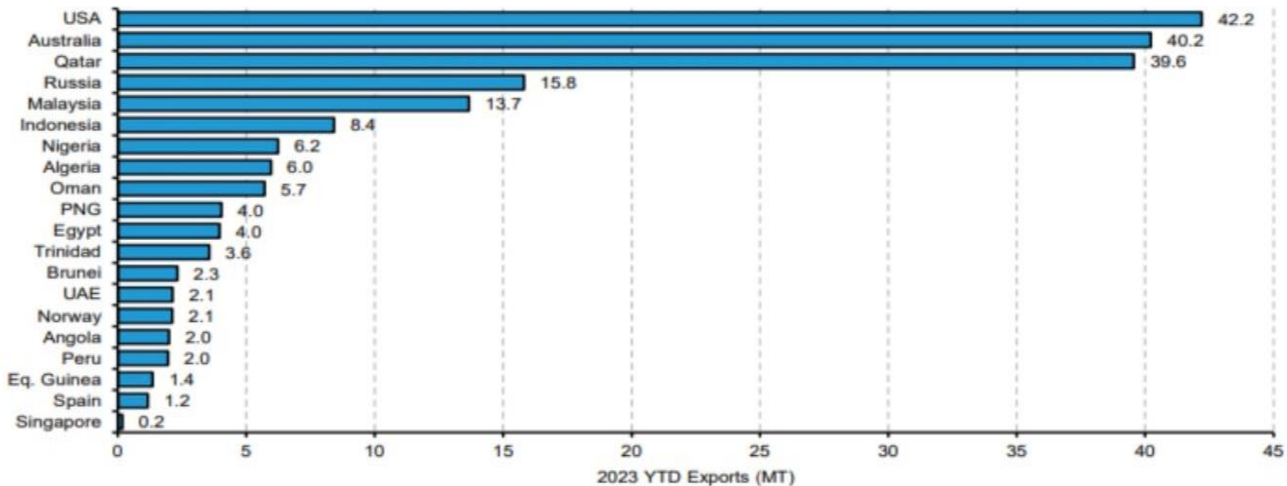
U.S. Natural Gas Imports/Exports



Source: Bloomberg, Bentek, TD Securities.

As illustrated in the below chart, today the dominant LNG exporting nations include the U.S., Qatar and Australia.

LNG Exports by Country in 1H23. U.S. Overtook Australia and Qatar as Largest LNG Exporter in 2023.



Source: Bloomberg, Bernstein Analysis.

In the next few years, the U.S. will widen its leading position within its LNG growth accounting for ~67% of total global growth between now and 2025-27.

Potential List of LNG Project Sanctions in 2023-27

Region	Project	Operator	MTPA	FID	Start	US\$bn Capex	per ton Capex
Middle East	North Field Expansion T1 & T2	Qatar Petroleum	15.6	2021	2025	14.4	921
Middle East	North Field Expansion T3 & T4	Qatar Petroleum	15.6	2021	2026	14.4	921
Asia-Pacific	Scarborough	Woodside	5.0	2021	2026	9.0	1,385
Total 2021			36.2				
North America	Corpus Christi Stage 3	Cheniere	10.0	2022	2025	6.5	1,000
North America	Plaquemines LNG Phase I	Venture Global	13.3	2022	2025	13.2	2,031
Total 2022			23.3				
Middle East	North Field Expansion T5 & T6	Qatar Petroleum	16.0	2023	2027	14.0	875
North America	Plaquemines LNG Phase II	Venture Global	6.7	2023	2026	7.8	1,169
North America	Calcasieu Pass 2 Phase I	Venture Global	10.0	2023	2026		
North America	Port Arthur LNG Phase I	Sempra	13.5	2023	2027	13.0	963
North America	Rio Grande LNG Phase I	NextDecade	17.5	2023	2027		
North America	Delfin FLNG V1	Delfin Midstream	3.5	2023	2027		
Total 2023E			67.2				
Asia-Pacific	Papua LNG	Total	6.0	2024	2028	8.0	1,333
North America	Rio Grande LNG Phase II	NextDecade	10.8	2024	2028		
North America	Port Arthur LNG Phase II	Sempra	13.5	2024	2028		
North America	Lake Charles LNG	Energy Transfer	16.5	2024	2027		
North America	Calcasieu Pass 2 Phase II	Venture Global	10.0	2024	2027		
North America	Freeport T4	Freeport	5.1	2024	2028		
North America	Delfin FLNG V2	Delfin Midstream	3.5	2024	2028		
North America	Cameron LNG T4	Sempra	6.5	2024	2028		
Total 2024E			71.9				
North America	Sabine Pass Expansion (SPL)	Cheniere	19.5	2025	2031	15.0	769
North America	Delfin FLNG V3	Delfin Midstream	3.5	2025	2029		
North America	Delfin FLNG V4	Delfin Midstream	3.5	2026	2030		
North America	Driftwood LNG Phase I	Tellurian	11.0	2026	2030	15.0	1,364
Asia-Pacific	Abadi LNG	Inpex	9.5	2026	2031	20.0	2,105
North America	Driftwood LNG Phase II	Tellurian	16.5	2027	2031		
Total 2025-27E			63.5				
Total 2023-27E			202.6				

Source: Bloomberg and Bernstein Analysis. Note: 202.6 MTPA is equivalent to ~27 bcf/d. Table doesn't include the Canadian projects including LNG Canada (~2.1 bcf/d with potential expansion to 4.2 bcf/d), which are scheduled to begin mid-decade.

So, what's the bottom line for the Canadian producers? Using data from the table below, demand requirements (excluding additional power demand, which is likely to occur in Alberta) suggest 13% of additional production by Canadian producers will be required by 2026 in order for exports to remain flat into the U.S. By 2029 Canadian producers are projected to require a 26-43% increase to meet demand, from today's levels. This growth requirement changes the supply/demand equation dramatically, which we believe provides compelling opportunities for Canadian investors.

Canadian LNG Project Summary

Project	In Service Date	Location	Type	Western Canadian LNG Projects			Status	Proponents
				LNG Production (MMTPA)	LNG Production (mmcf/d)	Nat. Gas Intake (mmcf/d) ^a		
Sanctioned								
LNG Canada - Phase I	2025	Kitimat, BC	Onshore	14.0	1,900	2,100	Under Construction	Shell, Petronas, Mitsubishi, PetroChina, KoGas
Woodfibre LNG	2027	Squamish, BC	Onshore	2.1	300	330	Under Construction	Pacific Energy, Enbridge
Total Sanctioned				16.1	2,200	2,430		
Awaiting FID								
Cedar LNG	2027	Kitimat, BC	Floating	3.0	400	405	FID Expected 4Q23	Pembina, Haisla Nation
Total Awaiting FID				3.0	400	405		
Potential Projects								
LNG Canada - Phase II	Not Disclosed	Kitimat, BC	Onshore	14.0	1,900	2,100	Under Consideration	Shell, Petronas, Mitsubishi, PetroChina, KoGas
Kai Lisims LNG	2027-2028	Prince Rupert, BC	Floating	12.0	1,850	2,035	Under Gov't Review	Nisga'a Nation, Rockies LNG ^b , Western LNG LLC
Total Potential				26.0	3,750	4,135		
Total Sanctioned				16.1	2,200	2,430		
Total Awaiting FID				3.0	400	405		
Total Potential				26.0	3,750	4,135		
Western Canadian Total				45.1	6,350	6,970		

a - Assuming 10% shrinkage at LNG facility; Cedar shrinkage closer to 1-2% as facility will use renewable power as opposed to natural gas feedstock
b - Rockies LNG is a consortium composed of Advantage, BirchDrift, Bonavista, Crescent Point, NuVista, Oventiv, Paramount, Peyto and Tourmaline

Source: Stifel Research.

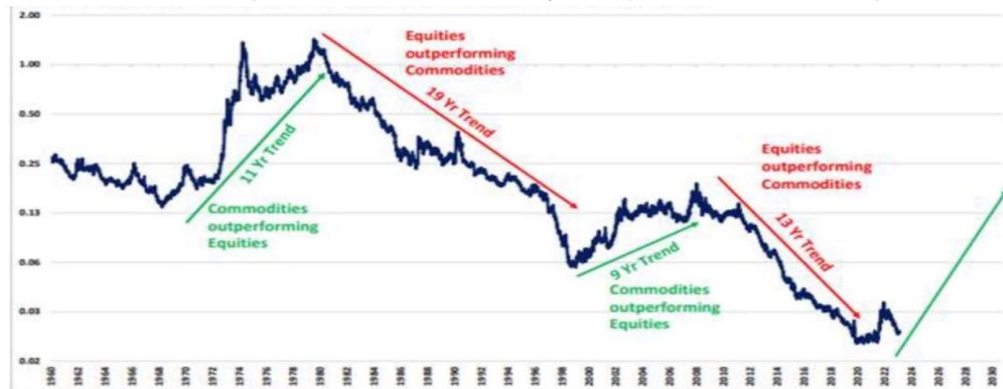
Why do we say time and patience are required? North American natural gas is on the cusp of becoming a global rather than regional source of energy. In North America, natural gas has typically been a fuel subject to seasonal supply and demand factors, including residential heating during the typical North American winter season. As time has progressed, natural gas has become somewhat less seasonal as the switch from coal to electrical generation has occurred but still hasn't totally erased those seasonality factors. Today, North American and European natural gas inventories are close to/at record highs due to a warmer 2022/23 winter season and lower industrial demand, particularly in the EU. We are also entering into an El Niño event, according to the National Oceanic and Atmospheric Administration (NOAA), which

typically results in lower heating demand in North America. These events don't derail the need for additional natural gas energy requirements, they simply may delay the impact of the required needs into the future year.

As time ticks on, we will continue to look for opportunities within the Canadian and North American energy markets as valuations remain disconnected from historical levels and our outlook of the energy space. So, what could change investors attitude towards traditional energy companies? Our narrative regarding energy is simple: when circumstances change, we will evaluate if the change is for the better. Currently, there are three areas within the space we believe should benefit long-term investors:

1. Energy companies are paying down debt (majority of companies complete or near completion), returning excess cash to shareholders (through dividends/share repurchases) and re-investing less into the business itself (growing 0-3% is typical).
2. The ESG narrative appears to be changing from right/wrong to what matters – a global reduction in emissions. Carbon capture is a large part of the equation, and as Alberta clarifies its policy in the near future, it will likely change the attitude of global investors, similar to what we are currently observing in the U.S.
3. Energy security will become of greater importance (e.g., EU) and industries will move towards nations with secure, reliable and abundant energy (note the incentive with the U.S. Inflation Reduction Act). We have already witnessed consolidation within the producers, integrated, services and pipeline companies awaiting their next chapter. So as an investor, will you be ready for the sequel?

Commodities to Equities Secular Trend Cycles (Commodities to Equities Ratio)



Source: Bloomberg. Stifel Research.

As always, we will continue to update you with our thesis on the space as additional narratives enter the market. Thank you for your continued support, and please reach out to the team if you have any questions.

Aleksy Wojcik, CFA
Portfolio Manager
Sionna Investment Managers



Sionna Investment Managers 161 Bay Street Toronto, Ontario M5J 2S1
For further information, please email clientrelations@sionna.ca.

The contents of this document are not intended to serve as advice, recommendations or an offer to sell any product or service. This communication is for information only and should not be regarded as a sales communication. Readers should seek qualified professional advice before acting on any information provided in or through this document.