3.8 Energy

This section describes the affected environment and potential environmental consequences for energy resources. The Board's environmental regulations at 49 C.F.R. § 1105.7(e)(4) require the analysis of impacts on the transportation of energy resources, the transportation of recyclable commodities, overall energy efficiency, and the diversion of traffic to freight transportation from rail to trucks. The Proposed Acquisition has the potential to affect the transportation of energy resources and overall energy efficiency.

3.8.1 Approach

This subsection summarizes the approach for analysis of energy resources. **Appendix N** presents a detailed approach. OEA focused the analysis on the transportation of energy resources and changes in overall energy efficiency because the Proposed Acquisition would not affect the transportation of recyclable commodities or cause the diversion of freight from rail to trucks.

The study area for the analysis of impacts on energy resources includes all rail lines in the integrated CPKC system in the U.S. on which trains would transport energy resources, and all rail lines on which rail traffic would increase as a result of diversion from other rail lines or diversion from truck transportation to rail transportation.

OEA assessed the effects on the transportation of energy resources and changes in energy efficiency (such as fuel consumption by trains, trucks, and equipment) due to rail-to-rail and truck-to-rail diversions. OEA considered the transportation of energy resources and increased traffic flows of energy-related commodities, such as oil, coal, and liquified petroleum gas (LPG[1]), that could be diverted onto the combined CPKC rail network from competing railroads or from other transportation modes if the Board authorizes the Proposed Acquisition.

Additionally, OEA analyzed increases and decreases in overall energy efficiency as a result of freight diversions from other railroads due to the introduction of single-line service; freight diversions from truck to rail; changes in operations at intermodal facilities that would meet or exceed thresholds for environmental review; and changes in vehicle delays at roadway/rail at-grade crossings (grade crossings) along rail lines where projected increases in rail traffic would meet or exceed thresholds for environmental review.

To perform the analysis, OEA considered the Applicants' proposed Operating Plan and traffic studies, commodities transported by CP and KCS in 2019 during a normal (pre-pandemic) operational year, operational data from relevant intermodal facilities, gross ton-miles (GTM) for 2019, and other data sources as necessary. The energy analysis is

[1] LPG should not be confused with liquified natural gas (LNG). LPG has been transported by rail for many years. However, under transportation regulations promulgated by the Pipeline and Hazardous Materials Safety Administration and FRA, transportation of LNG by rail is not currently allowed in the United States. For more detail about safety, see *Section 3.1, Freight and Passenger Rail Safety*.

consistent with data, approaches, and assumptions used in *Section 3.4, Truck-to-Rail Diversions; Section 3.5, Intermodal Facility Traffic;* and *Section 3.7, Air Quality and Climate Change.*

3.8.2 Affected Environment

Energy resources associated with CP and KCS involve the transport of energy resources by rail (for example, oil), the energy consumed by rail operations, and vehicles impacted by rail operations. Energy resources move throughout the rail network from Canada to Mexico on CP and KCS rail lines. In 2019, there were 75,664 total movements of carloads containing energy commodities, chemicals, and plastics. Inclusive of all commodities, there were 1,876,725 intermodal containers (units) moved in 2019. The movement of intermodal containers affects operations at intermodal facilities where these containers are managed, as well as the trucks that currently transport intermodal containers between rail lines and intermodal facilities.

In addition to the energy consumed in vehicles and equipment system-wide that is directly related to rail transportation of shipments, there are effects on energy from increased rail operations. Cars and trucks are required to wait at grade crossings based on increased train operations and consume fuel while delayed at these grade crossings. The affected environment related to energy resources is closely related to that of *Section 3.4, Truck-to-Rail Diversion; Section 3.5, Intermodal Facility Traffic;* and *Section 3.7, Air Quality and Climate Change*.

3.8.3 Environmental Consequences

The following sections detail the potential environmental consequences of the Proposed Acquisition and the No-Action Alternative associated with energy resources.

3.8.3.1 Proposed Acquisition

This section details the potential environmental consequences of the Proposed Acquisition associated with energy resources, including transportation of energy resources and energy efficiency.

Transportation of Energy Resources

To assess impacts on the transportation of energy resources, OEA evaluated information that the Applicants provided in their Operating Plan. In general, the Applicants expect that, if the Board were to authorize the Proposed Acquisition, the volume of energy commodities transported on the combined CPKC system would increase. However, this increase would be due to rail-to-rail and truck-to-rail diversions and the overall volume of energy resources transported in the United States would not change as a result of the Proposed Acquisition.

The Applicants' Operating Plan provides information on the projected shipment of energy commodities, including LPG, bitumen, crude oil, propane, and coal. The Operating Plan describes how the Applicants believe that the Proposed Acquisition would improve access to markets for energy commodities. The Operating Plan identifies three key diversions of rail

traffic from other rail lines to the combined CPKC system that would involve energy resources: (1) LPG movement from Alberta, Canada and other production regions to Mexico; (2) movement of products from Gulf Coast chemical plants to the areas where they are used; and (3) shipment of bitumen and crude oil from Alberta to the Gulf Coast (Brown and Zebrowski 2021):

- LPG Movement from Alberta and Other Production Regions to Mexico: The Applicants have stated that the Proposed Acquisition would provide LPG customers faster speed to market, reduced cycle times for loaded and unloaded cars, and overall fleet savings, which would encourage market growth through a safe and cost-efficient supply chain. For example, the Proposed Acquisition would create a single-line route from northern Alberta, Canada to Beaumont, Texas that would be 33 miles shorter than a competing route involving CP and Union Pacific rail lines via Chicago and would also avoid delays and handling costs associated with an interchange in Chicago. According to the Applicants, the improved transportation options for LPG originating in western Canada could create enhanced competition between western Canada and Ontario propane suppliers and propane currently sourced from production facilities in other locations, such as Conway, Kansas and Mont Belvieu, Texas for receivers served by KCS, particularly in Mexico. The Applicants project that the Proposed Acquisition would increase LPG shipments on the combined CPKC system by more than 1,500 carloads per year (**Table 3.8-1**) (Brown and Zebrowski 2021).
- Movement of Energy Products from Gulf Coast Chemical Plants to Areas of Use: OEA used the data provided in **Table 3.8-1** and **Table 3.8-2** for the Applicants' estimates of resources moved by rail including energy, chemicals, and plastics with a projected increase from approximately 21,000 potentially divertible carload movements in 2019 to 83,000 in 2027 under the Proposed Acquisition.
- Shipment of Bitumen[2] and Crude Oil from Alberta to the Gulf Coast: According to the Applicants, the Proposed Acquisition would potentially accelerate a shift away from the transportation of flammable crude oil (which is classified as hazardous material) toward non-hazardous DRUbit[3], from which the flammable diluent has been removed. The Applicants estimate an over 16,000-carload increase of DRUbit shipments under the Proposed Acquisition (**Table 3.8-1**) (Wahba and Naatz 2021). If a typical unit train is assumed to be 100 cars in length, this increase would be equivalent to 0.5 trains per day, or approximately one train every other day.

Several commenters on the Draft EIS stated concerns about oil shipments across Native American lands, near sensitive biological resources, such as the Nahant Marsh, and adjacent to rivers including the Mississippi River. A detailed discussion of the risk and potential

[2] Bitumen, also known as asphalt, is a dense, viscous, petroleum-based hydrocarbon that naturally occurs in oil sands and pitch lakes or is a residue from distilling crude oil.

[3] The DRUbit process starts at the railhead with a "diluent recovery unit" ("DRU"), which separates out and removes the diluent that has been added to raw bitumen in the production process, creating "DRUbit," a form of bitumen that is specifically designed for rail transportation. When trains carrying DRUbit arrive at a destination, the bitumen is processed and delivered to nearby refineries (Wahba and Naatz 2021).

environmental consequences of a spill of energy shipments is discussed in *Section 3.1.2., Hazardous Materials Transportation.*

Some of the additional trains that would use the CP rail line through the White Earth Reservation could transport DRUbit, which is a nonhazardous bitumen. According to the Applicants, the Proposed Acquisition could support a shift away from the transportation of hazardous crude oil and increase the transportation of the DRUbit alternative by an estimated 16,341 carloads per year. DRUbit is a tar-like substance that does not spread quickly and would likely not harm the environment or nearby communities if inadvertently spilled in the event of a derailment, thereby increasing the shipping safety compared to the original product, which is a hazardous substance. OEA expects that, although transportation of DRUbit would increase as a result of the Proposed Acquisition, the transportation of crude oil on competing rail lines would decrease and that the Proposed Acquisition would not change the overall volume of energy resources transported in the United States.

In conclusion, by increasing the percentage of non-hazardous DRUbit in energy commodities transported, the Proposed Acquisition would reduce the impacts from potential releases of energy commodities during transport.

Table 3.8-1. Energy Resource Shipment Estimates from Railroads Flow Diversion to CP and KCS, 2019 vs. Under the 2027 Proposed Acquisition

Energy Resource	Route	Total Diverted Carloads under Proposed Acquisition	Overall Percent Diverted
Non-hazardous bitumen (DRUbit)	Northern Alberta to Texas Gulf	16,341	69%
LPG	Alberta to Mexico	1,545	60%

Table 3.8-2. Energy Resource Shipment Estimates from Other Railroads Diverted to CP and KCS Rail Systems, 2019 and Under the 2027 Proposed Acquisition

	Energy Commodities, Chemicals, and Plastics (measured in carloads)	Coal (measured in carloads)
Estimated volume of existing 2019 rail traffic flows diverted to CP and KCS	21,143	n/a
Potentially Divertible to CP and KCS carloads/unit Under 2027 Proposed Acquisition		
Interline to Single-line Movements (extended haul traffic)	34,643	222
New Single-Line Movements (carloads/unit)	31,021	1,240
Total 2019 Movements	75,664	1,462
Total 2019 Potentially Divertible Movements	83,303	1,462

Energy Efficiency

OEA expects that the Proposed Acquisition would have a beneficial impact on overall energy efficiency. Because the Proposed Acquisition would support the diversion of freight transportation from truck to rail, OEA estimates that fuel consumption would decrease by approximately 7.97 million gallons per year under the Proposed Acquisition compared to the No-Action Alternative.

As shown in **Table 3.8-3**, OEA estimated the effects on energy efficiency and fuel consumption that would result from truck-to-rail diversions, changes in operations at intermodal facilities, and vehicle delays at grade crossings. The estimates in the table do not include the fuel that would be used to move freight that would be diverted from other rail lines onto the combined CPKC system. This is because increased fuel consumption on CPKC rail lines associated with diversions of traffic from other rail lines would be offset by a decrease in fuel consumption on the other rail lines from which the traffic was diverted. Therefore, those rail-to-rail diversions would not cause system-wide changes in energy consumption. Similarly, for changes in fuel consumption associated with intermodal facility activity, the table only reports fuel consumption from operational changes that would result from truck-to-rail diversions because any operational changes due to rail-to-rail diversions would be offset by decreased operations at other intermodal facilities and would not cause system-wide changes in energy consumption. OEA included fuel consumption related to vehicle delays at grade crossings in the calculation of total fuel consumption because

changes in rail traffic at grade crossings has a direct effect on the amount of time that cars and trucks spend idling. **Table 3.8-3** presents a summary of fuel consumption changes estimated to result from the Proposed Acquisition.

Table 3.8-3. Summary of Fuel Consumption Changes

Activity	**Change in Fuel Consumption (gallons/year)[1]**
Truck-to-Rail Diversions	-8,096,362
Operations at Intermodal Facilities	110,785
Over-the-Road Trucks	25,269
Lift Equipment	14,954
Yard Trucks	70,561
Vehicle Delays at Grade Crossings	12,118
TOTAL	-7,973,460

[1] Change in Fuel Consumption represents gallons of diesel fuel year, with the exception of Vehicle Delays at Grade Crossings, which is a projection for an increase in gasoline use.

The following sections describe the projected changes in energy consumption for each activity in further detail:

1. Energy Changes Due to Single-Line Service and Rail-to-Rail Diversions:

Under the Proposed Acquisition, OEA expects that fuel efficiency would increase due to the availability of single-line service. According to the Applicants, trains would not be interchanging between CP and KCS, which would lead to fuel savings within the network and enable new through train service. The current CP network does not offer intermodal service to Kansas City. Following the Proposed Acquisition, the integrated CPKC system would establish new intermodal services connecting Dallas, Texas with Chicago, Illinois and beyond, in addition to new single-line intermodal routes connecting Mexico with the U.S. upper Midwest and Canada. From a fuel efficiency standpoint, the Applicants state that CP already outperforms industry averages for locomotive fuel efficiency and continues to improve. Compared to the No-Action Alternative, OEA estimates that the Proposed Acquisition would increase fuel efficiency from 971 GTM/gallon to 1,024 GTM/gallon. This change in fuel efficiency was estimated from the Applicants' application and is consistent with the fuel efficiency factors used in *Section 3.7, Air Quality and Climate Change.*

The Applicants expect that the availability of single-line service would result in an increase of goods being moved by the CPKC system due to rail-to-rail diversions. OEA estimates that total freight diversions, from both other rail lines and truck service, would result in an increased consumption of 36,909,385 gallons of diesel per year on the combined CPKC rail lines. This estimate is based on the projected change in GTM that the Applicants provided and only includes rail line segments on which the projected change in rail traffic would exceed the thresholds for environmental analysis. As mentioned above, OEA did not include rail-to-rail diversions in the overall fuel consumption analysis because the increase in fuel consumption on the CPKC rail lines would likely be offset by a decrease in fuel consumption on the rail lines of competing railroads. However, the portion of total freight

diversions resulting from a truck-to-rail mode shift are accounted for as described in the following section.

2. Energy Changes from Truck-to-Rail Diversions:

Under the Proposed Acquisition, the Applicants estimate that truck-to-rail diversions would reduce truck traffic by approximately 80.4 million vehicle miles traveled. This corresponds to a decrease in diesel fuel consumption of approximately 10.8 million gallons. Rail traffic would increase slightly as a result of truck-to-rail diversions, corresponding to an estimated increase in fuel consumption of approximately 2.7 million gallons of diesel fuel per year. This increase in rail traffic due to truck-to-rail diversions would comprise 7.3 percent of the total increase in fuel consumption on the combined CPKC rail lines, with the remaining 92.7 percent resulting from rail-to-rail diversions. The increase in energy consumption by the CPKC rail lines that can be attributed to truck-to-rail diversions is based on accepted fuel efficiency factors for truck and rail transport. Overall, the net decrease in fuel consumption from the diversion of freight from truck transportation to rail transportation would be approximately 8.1 million gallons of diesel fuel per year under the Proposed Acquisition. **Table N.2-1** in **Appendix N** presents the total projected reduction in fuel consumption by trucks by state.

3. Changes in Energy Consumption at Intermodal Facilities:

OEA estimates that the Proposed Acquisition would result in an annual increase in fuel consumption of 110,785 gallons of diesel at intermodal facilities based on traffic data received from the Applicants. This increase in fuel consumption would be due to operational changes at intermodal facilities affected by the Proposed Acquisition. OEA's analysis focused on operational changes that would result from truck-to-rail diversions of intermodal freight because these diversions represent additional freight that was not previously transported by rail. Based on the Applicants' traffic studies, the number of intermodal containers is expected to increase by 216,675 from rail-to-rail diversions and 64,018 from truck-to-rail diversions, for a total of 280,693 intermodal containers. Accordingly, truck-to-rail diversions would account for about 22.8 percent of the total change in intermodal freight transported as a result of the Proposed Acquisition. This estimate does not include increases in intermodal freight from other growth factors, such as post-Acquisition changes in traffic patterns or investments by CPKC in growth opportunities made available by the resulting combined network.

OEA predicts that changes in intermodal facility operations from truck-to-rail diversions would result in an annual increase in diesel fuel consumption of approximately 110,785 gallons. This projected increase includes fuel consumption changes for the primary vehicles associated with intermodal facility operations (for example, trucks and lift equipment). **Appendix N** presents a full analysis of expected changes in energy consumption, data types used, and assumptions for each vehicle type.

4. Energy Changes from Vehicle Delays at Grade Crossings:

Under the Proposed Acquisition, OEA calculated the increase in vehicle delays at grade crossings and calculated an increase in fuel use of 12,118 gallons per year. Consistent with

the approach taken in *Section 3.3 Grade Crossing Delay*, OEA identified 277 grade crossings where potential changes in delay could result from the Proposed Acquisition. OEA identified those grade crossings based on the criteria of crossing at least one main track and a highway AADT of at least 2,500 vehicles per day. The identified intersections and associated traffic volumes are provided in **Appendix H2**. The anticipated diversions from truck-to-rail, as well as the overall increase in trains per day would increase rail traffic at these grade crossings, with delay increases expected for crossing highway traffic.

As shown in **Table 3.8-4** below, OEA predicts that annual gasoline consumption would increase by about 12,118 gallons per year because of increased vehicle delays at grade crossings. This is equivalent to approximately 33.2 gallons per day. However, this increase in gasoline consumption would be partially offset by decreased delays at grade crossings on other rail lines due to the diversion of rail traffic from those lines onto the integrated CPKC system.

Table 3.8-4. Change in Energy and Fuel Consumption from Vehicle Delays

Total Energy Consumption		**Energy Changes**	
No-Action Alternative (MMBtu[2]/year)	**Proposed Acquisition (MMBtu/year)**	**Change in Energy (MMBtu/year)**	**Change in Fuel Consumption (gallons/year)[1]**
4,495	5,953	1,458	12,118

[1] Conversion factor used for gallons of gasoline from British thermal units (Btu) was 120,286 Btu for 1 U.S. gallon (U.S. Energy Information Administration 2021), based on U.S. finished motor gasoline consumption in 2020, including fuel ethanol content.

[2] Metric Million British Thermal Units (MMBtu) is a measure of heat content or energy value, generally used as a unit of measurement for natural gas.

3.8.3.2 No-Action Alternative

Under the No-Action Alternative, the Proposed Acquisition would not occur and CP and KCS would continue carrying energy commodities on their separate networks, interchanging carloads through interline service. Energy commodities and other freight that is currently hauled by railroad competitors or moved by truck would not be diverted to the combined CPKC system. Therefore, no changes in energy efficiency (such as fuel consumption) would occur as a result of rail-to-rail diversions, truck-to-rail diversions, or changes in vehicle delays at grade crossings. Changes in the transportation of energy commodities and overall energy efficiency could occur as a result of changes in future market conditions and the operational needs of railroads but would not change as a result of the Proposed Acquisition.

3.8.4 Conclusion

Overall, the Proposed Acquisition would increase the volume of energy commodities being shipped on the combined CPKC system because the availability of single-line service would result in the diversion of commodities such as LPG, chemical products, bitumen, and crude oil from competing rail lines. The overall volume of energy resources transported in the U.S. would not change as a result of the Proposed Acquisition. With respect to energy

efficiency, the Proposed Acquisition would reduce fuel use by 7.97 million gallons per year, primarily due to truck-to-rail diversions. The fuel savings related to truck-to-rail diversions (8.1 million gallons) would outweigh the increase in fuel usage at intermodal facilities (110,785 gallons) as well as fuel consumed during wait times at grade crossings (12,118 gallons). Accordingly, OEA concludes that the Proposed Acquisition would not adversely affect the transportation of energy commodities or energy efficiency and is not recommending any mitigation related to energy.