



Authentix National Fuel Integrity Programs

Enabling Governments to Optimize Tax Revenue, Reduce Carbon Emissions, Improve Fuel Quality, and Fund Public Infrastructure

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“Authentix is the global market leader in establishing and managing national programs for governments to protect the public fuel supply chain and prevent widespread illicit trading, smuggling, and tax fraud. It is important to understand the damaging effects of fuel fraud to national governments and citizens and how adopting a national fuel integrity program can generate not only a huge financial return on investment, but also result in many other benefits for all stakeholders concerned.” – Kevin McKenna, CEO

1. Why do National Governments Rely on Authentix to Implement and Operate National Fuel Integrity Programs?

In the last 25 years, dozens of national governments have selected Authentix to provide the technology and support services to start and operate national fuel integrity programs (NFIPs) with the aim of reducing illicit trade, smuggling, and adulteration of the country's fuel supplies. Primarily, governments are quick to produce high returns on investments in and enforcement of these programs as illicit trade is reduced, and criminals are no longer able to profit through fraud and tax avoidance. Authentix also appreciates that markets are never static and new threats will always appear. Therefore, we design all our programs around continual improvement to constantly address the changing scope in illicit activity. Additionally, Authentix is committed to capacity building and

knowledge transfer striving to empower and train the local work force in utilizing the best-in-class technology.

Prior to implementing a NFIP, many countries had experienced between 30%-40% total fuels sales coming from illicit activity including several methods of illegal trading such as:

- Smuggling non-taxed, low-taxed, or subsidized fuels from neighboring countries and selling these as fully taxed fuels.
- Adulteration (commingling) with off-road, tax exempt, or subsidized fuels and selling as fully taxed fuels.
- Adulteration/dilution of high-quality refined fuel with substandard or inferior quality products such as kerosene or waste oil and selling to the unsuspecting consumer as high quality, fully taxed fuel.
- “Round Tripping” where untaxed products destined for export or transit through the country never leave the national borders and are dumped into the legitimate supply chain.

“During the first few months after the fuel marking program begins, the initial results reveal the overall extent illicit fuel trade is present in the country. In most cases, using this data, officials become very motivated to begin enforcement and remediate this nefarious activity. It feels very rewarding both personally and professionally to know we are helping solve such a large problem that will soon result in sweeping change and be such a benefit to the governments and citizens alike.” - Kristi Browne, COO and over 20 years with Authentix

2. The Adverse Effects from Illicit Trade of Fuel Products

In addition to the obvious loss of excise tax revenue to the country from criminals who profit from these fraudulent activities, there are many detrimental outcomes when allowing this nefarious activity to go unchecked including:

- Lower revenue collection by the government and less public funds for roads, schools, healthcare, and other important infrastructure needs of the citizenry.
- Possible need for the government to increase marginal or other taxation rates on the citizens to make up the funding shortfalls caused by these fraudulent schemes.
- Environmental damage and increased air pollution caused by low quality and sometimes dangerous adulterants present in the country's fuel supply chain.
- Lower fuel efficiency by vehicles where fuel or oil adulterants can reduce the fuel quality and engine performance standards.
- Increased costs to consumers and industry via damage to motor vehicles and other motorized equipment caused from use of low-quality oil and fuel adulterants not specified for use by these vehicle manufacturers.
- Reduction of legitimate and compliant retailers who cannot compete against illicit operators' reduced cost basis.

3. The Quick Payback to Implementing Authentix NFIPs

In the dozens of NFIPs implemented by Authentix on behalf of governments around the world, the positive impact has been rapid, consistent, and substantial in counteracting these adverse effects and ongoing damages of illicit fuel trading. It is common to see significant reductions in illegitimate fuel in the supply chain within only a few weeks of the program's inception. In fact, well within the first year of program inception to see previous fuel supply compromise rates easily cut in half and even greater reductions through the remainder of the first year. As the program gains velocity and following successful enforcement activity, it is common to see illicit activity drop below a 5% rate.

In case studies completed on various programs, it was common for the illicit trading of fuels to go from over a 30% compromise rate to less than 5% in a matter of months from enforcement starting. Through continued program

operation and ongoing enforcement, countries have been able to sustain these single digit compromise rates perpetually. Given the increased collection of legitimate taxes, the program metrics means the client could easily pay for the initial NFIP investment within a few months. Continued enforcement through suitable legislation then allows these gains to be protected through the life of the program.

For most countries, excise tax collections from fuel sales can be a major component of the government's budgeted revenue often exceeding over USD250 million in smaller countries and billions of dollars in larger countries. With such large numbers at stake, cutting fuel fraud even a few percentage points can result in a massive return on investment for the government, often more than 20 times the annual cost of the NFIP. In many instances, Authentix clients have seen fuels excise tax revenues increasing by USD50 million to hundreds of millions per year. In a single client circumstance that was one of the first to institute an Authentix NFIP over 20 years ago, the total recovery of additional funds is estimated to be more than USD2 billion in the last 23 years.

“Having over 25 years of experience in the design, startup, and operations of so many different fuel integrity programs, one is quick to realize that each country's government, political situation, policies and laws, culture, budget, and fuel distribution systems are vastly different. Authentix takes the approach that “one size does not fit all” and each new program is designed to empower the client to make specific choices and preferences for procedures, information management and access, and enforcement policies. We consider the client to be the foundation and driving force for ultimate success” - Charles White, PhD, V.P. of Fuel Program Operations

4. The Environmental Benefits of Authentix NFIPs

While most governments are starting to consider implementing NFIPs due to the positive experiences of other countries who have already deployed a program, there are many more returns on investment to be realized beyond the large tax revenue increases. Reducing the amount of low-quality and harmful

adulterants in the fuel supply has an immediate and extremely positive impact on air pollution and can allow a country to meet its commitments and be compliant with international air quality standards established through international and cooperative treaties. These treaties, such as the Stockholm Convention enacted in May of 2001, brought most countries together in a global, written pact agreeing to ban harmful Persistent Organic Pollutants (POPs) from being used. Many fuel adulterants being added to dilute legitimate high-quality fuels contain POPs, or precursors to POPs and are harmful to air quality and toxic to humans. By eliminating these adulterants from the fuel supply the government is also reducing air pollution.

With an Authentix NFIP, the chemical and covert markers to track and identify the fuel to confirm compliance do not affect the quality of the marked fuel and are environmentally safe. In fact, the proprietary and patented covert markers used by Authentix in these programs are made from Carbon, Hydrogen, Oxygen, and Nitrogen (CHONs) which are already compositional elements of high-quality diesel and petrol fuels today. Further, these covert markers are added to the fuel supply at extremely low concentrations, often at a low parts per billion (ppb) level. To fully understand and visualize something at, say a concentration of 10 parts per billion, imagine starting a trip to fly from Eastern Asia to the tip of South America, which is approximately 14,000 miles. As you begin the journey, you take a half step to pick up your bag. You have now traveled 10 parts per billion of the planned trip, just a distance of 8 inches out of the total 14,000-mile journey.

5. Authentix NFIPs Save Consumers and Vehicle Manufacturers Money

Authentix fuel markers cause no harm to combustible engines and are also approved for use in the fuels for many of the world's largest branded fuel companies. Unfortunately, this is not the case for harmful adulterants and other oil waste products added to fuels through illicit trading. In today's modern vehicles, carburetors, fuel injectors, real time oxygen sensors, catalytic converters, exhaust filters and other expensive, computer controlled electronic components are all precisely engineered to work with specific fuels having

minimum quality thresholds for composition including those able to utilize fuels containing percentages of ethanol. However, as non-fuel hydrocarbons and other substandard chemicals are intentionally added to dilute quality fuels for profit seeking, vehicle fuel systems and other components can be severely damaged even resulting in catastrophic engine failure. These costs are extremely high for both consumers and vehicle manufacturer warranty claims in countries experiencing prominent levels of fuel adulteration.

While many consumers try to purchase fuel from reputable retailers it is next to impossible to know if the quality of any fuel being dispensed to a vehicle meets the minimum government and vehicle manufacturers requirements. And it is not just the retailers who are suspect in these cases as even the most high-quality and well-intentioned branded fuel retailers can fall prey to the illicit wholesale transporters and distributors involved in fuel adulteration and supplying these retail stations. Regardless, implementing an Authentix NFIP is the first important step to improving overall fuel quality by eliminating these harmful adulterants and reducing repair and warranty costs to the consumer.

“The advancements Authentix has made in fuel marking technology over the years has outpaced the competition by leaps and bounds. Our engineers and scientists are uniquely dedicated to the fuel authentication industry and stay focused on product development, regional regulations, and listen to our client’s feedback to constantly provide the latest proprietary advancements in cloud-based information systems, mobile apps, and chemistry to solve the arising needs in the market.” – Jim Seely, V.P. of Program Solutions, and 25 years with Authentix

6. The End Result to Enacting a NFIP? It is the Citizens Who are the Ultimate Winners

While increased tax revenue and high return on program investment is an immediate and clear benefit from an Authentix National Fuel Integrity Program, it is the common citizen and consumer that ends up benefiting the most. With the increased excise tax revenues for the government, there is less reliance on taxation of consumer income or use tax that often becomes necessary to

replace the lost revenue from illicit fuel trading. Also, as fuel quality in the country improves from less mixing of low-quality adulterants into the fuel supply, fuel efficiency improves, and costly repairs and unforeseen maintenance issues diminish. Citizens have improved air quality and governments have more resources to build improved highways, airports, and other infrastructure projects necessary to improve the quality of life for all its constituents.

7. Selecting the Right Solution Provider for NFIPs Makes all the Difference. With the Most Fuel Authentication Projects in the World, Authentix is the Market Leader and The Authority in Fuel Authentication

Authentix is the market leader in Fuel Integrity Programs with over 25 years of experience and more active National Fuel Integrity Programs deployed than any other company. Providing our clients with the most sophisticated marking technology, cloud-based software suites, mobile applications, supply chain management tools, documentation, and more is our only focus. Our driving purpose is to create a world of confident commerce and ensure the safety and integrity of products purchased by consumers and companies every day. For more information, please visit our website at www.authentix.com or contact us at info@authentix.com.