

Royal City Men's Club

BILL ROWLEY JULY 25,2019

The Motor Vehicle Manufacturers say that the

BEST WAY TO PREDICT THE FUTURE IS TO CREATE IT ...

IT'S IMPORTANT TO REMEMBER -----IT TAKES FOUR YEARS TO CREATE A NEW VEHICLE

Note; The word from car companies is that boring compact electric vehicle design seen sparingly on roads in recent years will die as electric vehicles evolve into machines more people actually want to BE SEEN DRIVING.

“ Ford says there is going to be an explosion of new designs”. There's going to be a lot more choice coming from all manufacturers.

TODAY'S TALK

Low Emission

HYBRID or as HEV

Hybrid Electric Vehicles

PHEV Plugin Hybrid EV

Zero Emission

BEV

- Battery Electric Vehicles

Zero Emission

FCEV

- Fuel Cell Electric Vehicles

(Hydrogen Fuel Cell)

Zero Emission

Lets take a look at how many dollars the manufacturers are spending on this project

AV

2015 to 2023

Vehicle Manufacturers and Investments in EVs

<u>Ford</u>	11 Billion	Jiangling Motors	
<u>Fiat Chrysler</u>	10 Billion	Toyota	14 Billion
General Motors	8 Billion	Honda	560 Million
	91 Billion	Volvo	730 Million
<u>Volkswagen Group</u>	10 Billion	Mazda	250 Million
Tesla	6.5 Billion	Hyundai / KIA	20 Billion
BMW/MINI	2.5 Billion	Renault	30 Billion
<u>Jaguar-Land Rover</u>	770 Million	Changan	15 Billion
Peugeot Citron	10 Billion	Chinese	70 Billion
Nissan		Manufacturers	

Note: Speculation is that by **2040** 3/4 of all new car sales in the world will be EVs

Total: 300 Billion Dollars

Volkswagen Group

Volkswagen Car

Audi AG

Lamborghini S.P.A

Bentley Motors Ltd.

Bugatti S.A.S.

Porsche A.G.

Ducati (Motorcycles)

Man S.E. (Parts manufacturer)

Scania A.D. (LOCOMOTIVES)

Seat S.A.

Scoda Auto

TRATON (Transport Trucks)

Volkswagen Brazil

Volkswagen Commercial Vehicles

Part Owner of Navistar

IMPORTANT MESSAGE

I need to make it very clear that vehicle manufacturers want the public to be aware that the automakers cannot and will not ignore their current customers and their needs.

However a “wait and see” approach until USA and CAN. Customers Demand for EVs and AVs won’t do.

The Market has the potential to Change very quickly these days so we will be building a lot of various kinds of vehicles for a long time to come.

But in order to make all of this happen we must eliminate production and pay less attention to vehicles people don’t any

longer care about! Now being that about 1/3 of you are coffee brew masters, I normally judge you on how many cups of Coffee to brew— however today I get to judge your memory skills and knowledge of 4 years ago. **SO HERE IS A 2020 ESCAPE TO TALK ABOUT DESIGNED 4 YEARS AGO**

Think back 4 years to 2015 when this car was planned

2020 Ford Escape Brings With It A Plug-In Hybrid Option



2 inches wider –2 inches lower --and—4 inches longer than the 2019 ESCAPE

Six Mega Trends -- Affecting the Vehicle Manufacturers

1. TECHNOLOGICAL CHANGE

2. ENVIRONMENT SUSTAINABILITY (happening quicker than planned)

3. DEMOGRAPHIC CHANGE

4. URBANISATION

5. GLOBALIZATION

6. POLITICAL UNCERTAINTY

POLITICAL UNCERTAINTY

TRUMP— On June 7th (this year) 17 Automakers sent a letter to President Trump pleading that he set ONE national standard for fuel economy and greenhouse gas emissions

-- President Trumps one year 25 % steel and aluminum tariff cost Ford alone 1.5 Billion dollars. And if it went through that Mexico could not slow down the

people

movement at the US border just weeks ago could have cost GM and Chrysler

millions

of dollars daily. All GM pick-up trucks and Chrysler Ram trucks come from

Mexico.

-- In the USA 13 states are following the CALIFORNIA POLLUTION and GAS CONSUMPTION

LAWS but the OTHER 39 STATES are following the FEDERAL less stringent laws.

As of

June 7th the 17 north American auto manufacturers sent a letter to TRUMP

GLOBALIZATION and WORLD WIDE FREE TRADE ISSUES

USA VS EUROPEAN /PARIS AGREEMENT -- meaning Free Trade uncertainty
and our own NORTH AMERICAN uncertain NAFTA agreement
between Canada USA and Mexico

CHINA / USA These two countries are playing havoc with Guelph's
own Linamar automotive parts suppliers.

ENGLAND WAITING TO VOTE ON A NEW PRIME MINISTER

DEMOGRAPHIC and URBANIZATION

**There has never been urbanization of this scale in the history of the
WORLD!**

- Shanghai -- GROWING AT THE RATE OF 1 MILLION EACH YEAR
- SOUTHERN MALAYSIA –The RAPID DEVELOPMENT PACE
- TORONTO -- GROWING AT A RATE OF 250.000 EACH YEAR

The Canadian federal government has a SMART CITIES plan.

St. Clair village captures new URBAN VISION

Ashbridges Bay 60 acres“ CROSS TOWN” project is in approval stages

ENVIROMENT SUSTAINABILITY

Absolutely –NO one can predict the future as it is not an observable entity that exists, therefore it cannot be described. **However** do to the various scientists prediction of what we have done to create the world changes to the environment caused by carbon fuels countries have taken and created laws forbidding carbon fuels such as –Coal, Gasoline, Oils, Diesel Fuels just to name a few.

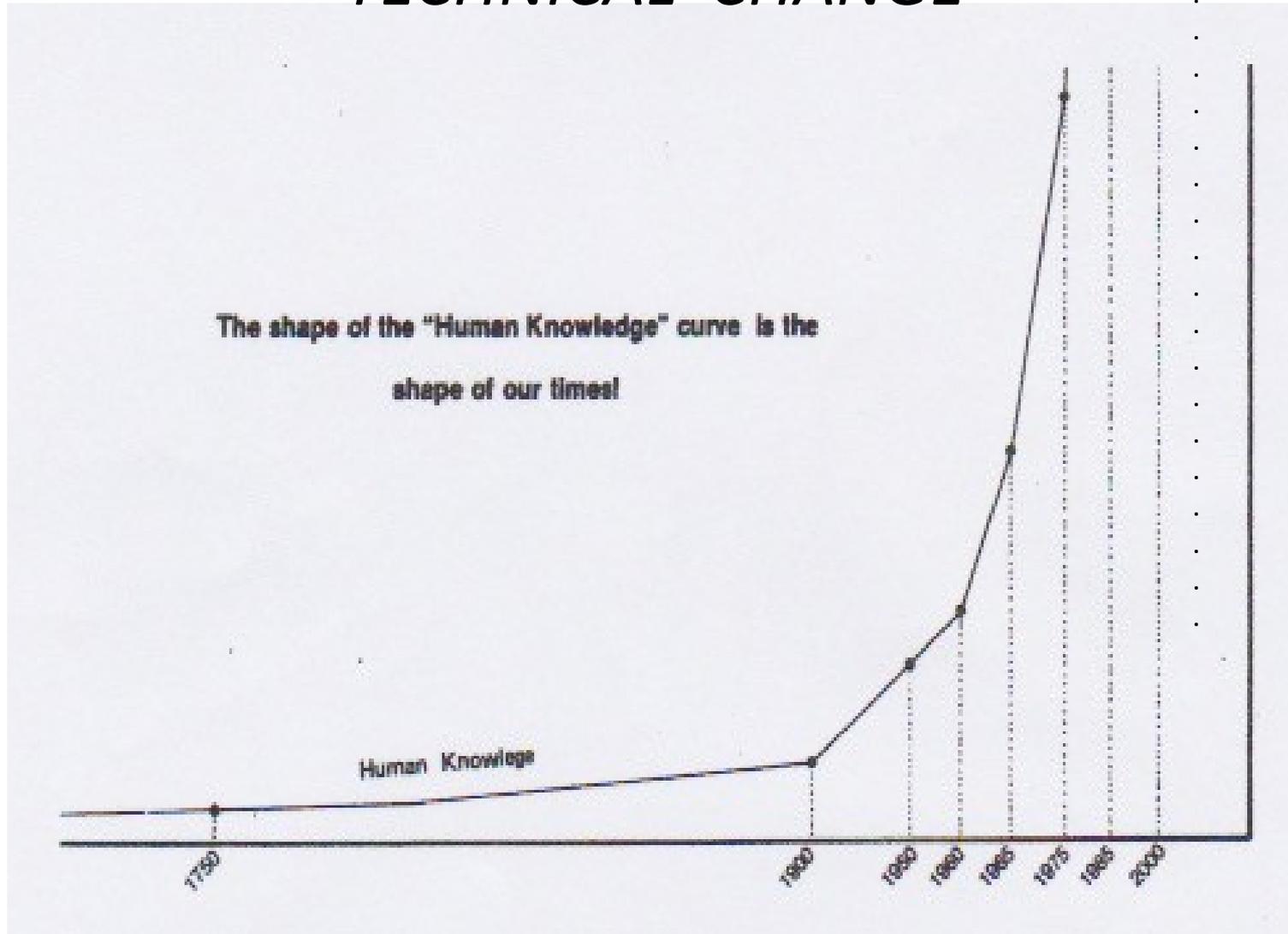
For example: England, France, Germany, India, Sweden, Norway, Australia, New Zealand, Netherlands, & China.

These 10 countries are a few countries that have already set a specific date when no longer motor vehicles will be sold, using the ICE and Diesel engines.

NORWAY FOR EXAMPLE has stated that 100% of vehicles sales to be zero emissions starting in 2025 and the Netherlands 100% by 2035

Note— Ford will use 100% renewable energy for all manufacturing by 2035
And also eliminate single- use of plastics from operations by 2030

TECHNICAL CHANGE



2040

Prediction created 1971 updated July 2019 Bill Rowley

MORE CHANGE IS ABOUT TO HAPPEN THAN WHAT TOOK PLACE DURING THE LAST 100 YRS

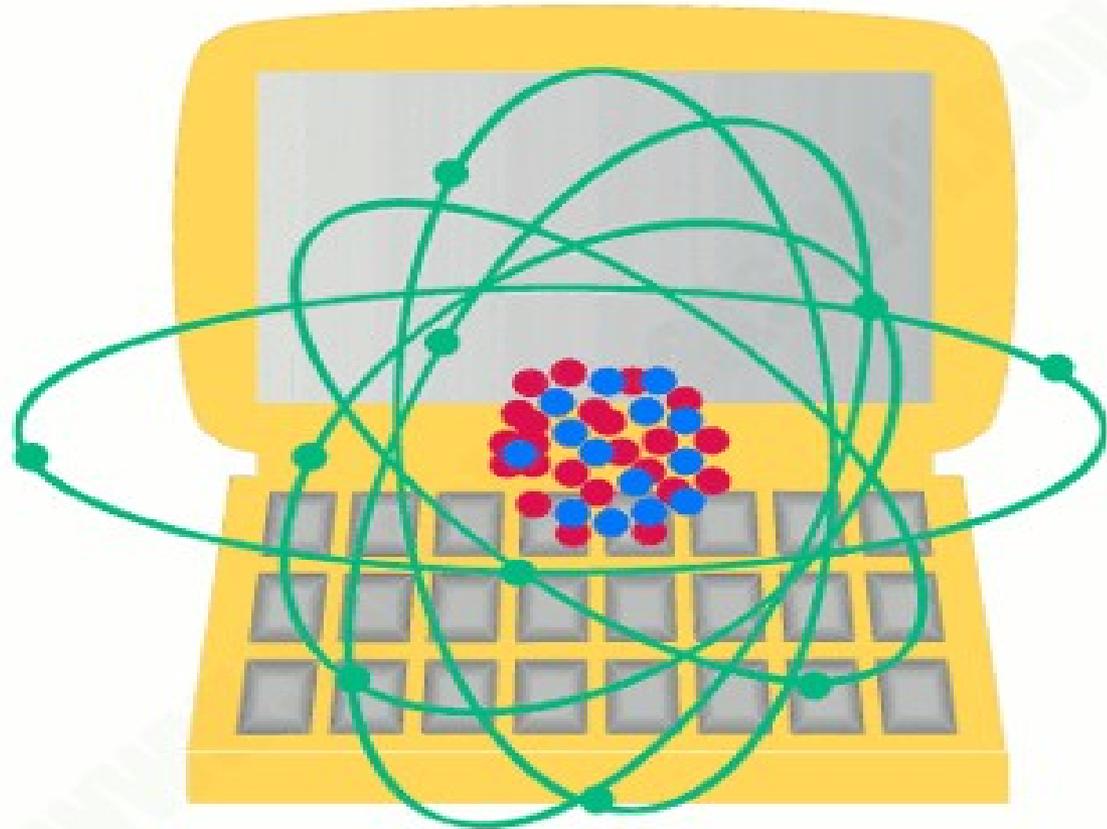
2020

Quantum Computing

2040

CYBERSECURITY
TRANSPORTATION
HEALTH
FINANCE
DEFENCE
ARTIFICIAL INTELLIGENCE
MINING
AGRICULTURE

AND MANY MORE



Quote by mike Dixon -1 month ago...The pull of Technology requirements for human exploration yield significant benefits to all industry.

Need answers for BEVs

DIFFERENCES BETWEEN HYBRID and EVs

- A hybrid vehicles can have a variety of engines and also has a electric motor/generator that charges a battery when the electric motor's torque is required. No external charging required
- . Automotive Hybrid batteries in most cases don't require external charging they are charged by the electric motor/generator
- . A hybrid vehicle that uses a gas engine along with an electrical plug – in for charging its battery is called a **PHVE** . This system is for drivers who frequently travel greater distances.
- PLUG- IN Hybrid vehicles have a larger battery than a standard hybrid that does require recharging to achieve greater travel distance
- . EVs are fully dependent upon an Electric motor for power and a much larger battery .these vehicles are rated zero emission

EV BATTERIES

- There are three basic type of batteries being used:

Lead Acid

Nickel-metal hydride “ NiMA” used prior to 1999

Lithium-ion “ Li-on “

Note – The Li-on battery is primarily used today.

it is the lightest of the 3 types

doesn't like extreme temperatures --too hot –too cold.

FUTURE . .is for solid state batteries - which use hi capacity electrodes

these batteries will have 2 to 3 times the energy capacity

than the Li-ion.

EVs “ELECTRIC VEHICLE”

Questions
That Require a show of Hands

Question One

- A. Is there anyone who does have a garage to park his vehicle and uses it for his vehicle?
- B. **B.** Is your garage heated?

Question Two

Hands up for those who in cold weather start their vehicle and let it warm up before driving off?

Questions That Require a show of Hands

Question Three

Hands up if your vehicle is equipped with one or several of the follow accessories:

Mandatory

- Steering
- Brakes
- Defrost blower
- 4 way flashers
- Back up lights
- Head Lights
- Park Lights
- Back-up Camera
- Day Time Running lights

Other Accessories:

- Heated back window
- Automatic windshield wipers
- Power windows
- Heated seats
- Speed control
- Airconditioning
- Heated outside mirrors
- Rear windshield wiper
- Power Seats
- Radio
- Navigational system
- Clock
- Electric door locks
- Fog lamps
- Exterior theft control
- Power sun roof
- Back window defroster
- Automatic back tailgate

Last Two Questions

Hands-Up: For those who enjoy your current vehicle accessories and would equip your next vehicle with the same items?

Hands-Up: If you are prepared to purchase your next vehicle without any accessories?

Things to Know About EV Batteries

The efficiency and all –electric driving range of plug-in electric vehicles varies based on a number of factors:

- Driver Habits
- Driving Conditions
- Temperature (such as hot or cold weather)
- Accessories

Extreme Weather

Very hot or cold conditions impacts range in EVs. The additional heating and cooling needed for passenger comfort requires more energy. Cold batteries also have greater resistance to charging and do not hold a charge as well.

EXAMPLE Cold testing at (6 degrees Celsius), shows that an EV battery can loose as much as 45% of energy leaving only _55%_ of battery energy to drive the vehicle, while also reducing the travel distance

Hot test at about (35 degrees Celsius) can affect a battery's capacity by 43% again restricting travel available distance.

continued

Things to Know About EV Batteries

Battery Life

EV batteries have a ***cycle life***. This means each time you charge and discharge an EV battery the life of the battery is reduced and so is the available travel distance affected. Each time you ***charge the EV Battery*** you can also count on not being able to travel the same distance each time.

Note: EV Insurance is more than a regular vehicle

Things We Need to Know About “Ev BATTERIES”

EVs –require battery charging

For the past several years Ford Motor Company have been working with Queen’s University the University of Waterloo and its investment in Blackberry Research. And I can share with you that Waterloo’s Research has been able to increase energy storage of EV batteries from 200 kilometers to 600 kilometers

Note Increased battery capacity with the use of Cobalt has recently been discovered. If used could rekindle interest in the Ontario mining industry

EVs and Hybrids are generally known as “Green Vehicles” because they burn less fossil fuel compared to non-hybrids .

Most 2020 Hybrid vehicles have a regenerative braking system using kinetic energy to assist in charging the EV Battery.

What's next NOTE::: government concerned because EVs don't use gasoline.

EV batteries need little or no maintenance, however EV batteries don't like extreme temperatures and require a thermal system to keep from overheating or cooling. They also need protective circuits to prevent them from overcharging or excessively draining.

Although the cost of EV batteries have come down they are still relatively pricy. (year 2010-\$1,300) (year 2016 \$350.00) future forecast for 2025 is \$130.00

Some research companies are working to develop solid-state electrolytes which have two or three times the energy compared to current EV batteries

EV Batteries are prone to catching fire during a vehicle accident.

There is also the possibility of supercapacitors, which would quickly store and release energy and might one day eliminate batteries altogether.

Electricity can be created by a HYDROGEN MOTOR- (no need for a battery)

EV HOME Battery Chargers

Level 1 – Home charging

Standard 120 Volt outlet

Charging time

A level one charge simply requires a standard 120-volt outlet. The power demand is about the same as a 1500 –watt air conditioner

Plug in hybrid: 6 to 8 hours

Electric: 11 to 16 hours

2 to 5 Miles of range per hour of charge

Level 2 – Home charging

Charging Station 240-Volt

Charging time

A level two can be done using a 240-volt charging station installed outside your home or inside your garage. The power demand is comparable to a stove or clothes dryer.

Plug in hybrid: 3 to 4 hours

Electric: 6 to 8 hours

10 to 20 Miles of range per hour of charge

Level 3 – Not for home charging .These are Direct Current Fast Chargers. They use a 480 volt system and can charge a vehicle to 80% in about 30 minutes

Public Chargers

Typical slow speed public EV chargers offer about 20 miles of driving distance per hour at the plug

The next level charger, called a fast charger, can add about 75 miles in 30 minutes at the plug

Note: Trillium, (Australia) formed by members of a solar racing team, makes charging pumps that add more than 215 miles of range in 10 minutes. Customers include a consortium of vehicle manufacturers including Ford and Volkswagen.

These faster chargers are waiting for **Battery Technology** to catch up

of PUBLIC EV CHARGING STATIONS

CANADA -- 842 BC 116, ALBERTA 46, SAS. 17, MANITOBA 10, ONTARIO 187'
QUEBEC 377, NB 37, NS 32, PEI 12, NEWFOUNDLAND 8

USA -- 67,500

CHINA -- 330,000 NOTE SHANGHI ALONE HAS A POPULATION OF 21 MILLION

MEXICO CITY HAS A POPULATION of 21 .6 million

QUESTION time ???

Autonomous Vehicles

General Motors

Current plans are to provide Taxies and Delivery Vehicles

GM Cruise's driverless taxie fleet services is running into opposition for permission by Washington-- National Highway Administration to put a minimum of 5 driverless cabs without steering wheels or control pedals on public roads.

National Insurance approval was also rejected. Especially since a petition of 97 pages was provided by GM with no data that establishes-- absolute value of safety of its vehicles

Autonomous Vehicles

Ford Motor Company

Ford has been storing up the travel needs from two test markets

They took their new TRANSIT people mover and provided a pick-up & return service for people requiring doctor and hospital travel and drug store assistance. Currently this is a service provided in over 50 major cities throughout the USA

Secondly, Ford purchased several EV skateboard companies and providing them and EV bicycles in major cities and tracking where people wish to go within cities. Ford then will use this data to perfect the needs of providing Driverless vehicles to replace these current needs

Ford has also market tested with actual AV vehicles in operation with certain delivery services like Pizza and UPS in some 25 city locations.

Autonomous Vehicles Requirements

Not One, or Two, or Three, but – But Autonomous vehicles will require 4G cellular service but will also require 5G in order to be able to connect to other smart vehicles and have available speed of the sensors to function as required today.

- 1G was an Analog Cellular System
- 2G 1st generation of digital cellular technology
- 3G Increased speeds from 200kbps to a few Megabits per second
- 4G Increased speeds up to Hundreds of Megabytes and Gigabyte-Level Speeds of data.**
- 5G 2021 brings 3 new aspects to the table
 - 1. Greater speeds (moves more data)
 - 2. Lower latency (to be more responsive)
 - 3. Ability to connect to more devices at once

Ford Accelerates Connectivity Strategy in China; Targets Production of First C-V2X-Equipped Vehicle in 2021



Autonomous Vehicles Requirements

Autonomous vehicles will obey all the rules of the road, as well as all speed limits. Someday we may be even getting rid of Stop lights entirely.