



Europe and Natural Gas - Are Tough Choices Ahead?

Posted by [Rune Likvern](#) on August 3, 2010 - 12:14am in [The Oil Drum: Europe](#)

Topic: [Supply/Production](#)

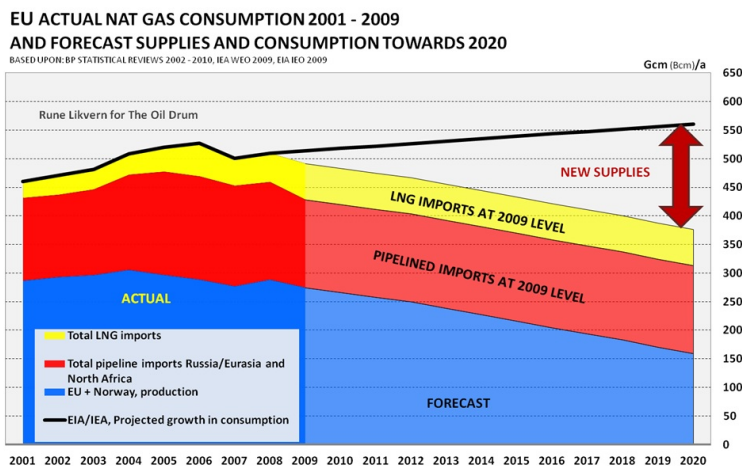
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In Europe, natural gas has great importance. Many people believe (some countries even instituted policies) that it will be the fuel that will become the bridge to an energy future with less reliance on coal and nuclear power. Furthermore, in 2009, about 26% of the primary energy consumption of the 27 members of the European Union came from natural gas, making it a very important fuel today.

In this post, I present some graphs showing European historical natural gas consumption and supply, along with my estimates of future consumption and supply. Based on my analysis, there may be a shortfall in supply very soon, especially if sufficient new sources of supply are not found, or if natural gas is used as a substitute for other energy sources. More specifically, the findings from my analysis are as follows:

- It is projected that between now and 2020, Europe will need to develop additional natural gas supplies of approximately 120 - 150 Gcm/a (thousand million cubic meters per year) from more distant sources, if demand as projected by EIA and IEA is to be met.
- As of 2009 Europe obtained approximately 47 % of its natural gas supplies from distant sources; this is projected to grow to more than 70 % by 2020.
- Europe's growing dependence on natural gas from more distant sources may also impact its future policies to ensure security of energy supplies.
- If additional supplies fail to appear, Europe could see an imbalance in natural gas supply and demand starting as early as 2011/2012.

These issues also raise questions as to the feasibility of using natural gas as a substitute fuel for transportation within Europe. The IEA, in its Mid Term Market Gas & Oil 2010 report, shows growing natural gas demand in Europe, similar to what one might expect if natural gas is being used for new purposes. I could not find any indication in that report, however, as to where this new supply might come from.



This diagram shows actual natural gas consumption between 2001 and 2009 for EU, split between Europe's (inclusive of Norway's, even though Norway is not a full member of the EU) own production and imports by pipeline and LNG. It also shows forecast growth in demand (black line) to 2020 based on EIA and IEA projections. The light blue area is my projection of Europe's natural gas production. The light red and light yellow areas indicate expected pipeline imports and LNG imports, if these stay at 2009 levels. I calculate the required amount of additional supply by subtraction.

More below the fold.

DISCLAIMER: The author holds no positions in the oil/energy market that may be affected by the content of this post.

EUROPE'S DEVELOPMENT IN NATURAL GAS SUPPLIES AND RESERVES

Below I will present developments in Europe's natural gas production and reserves. I also describe how additional supplies by pipeline and LNG have developed in the recent years for both source and end user. It has been an objective for many European countries to diversify their sources for natural gas supplies.

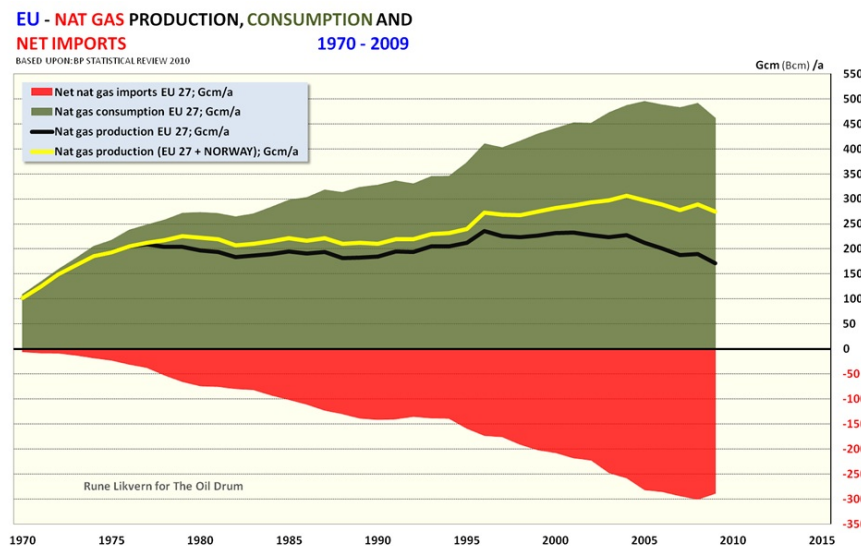


Figure 01: *The diagram shows developments in EU's natural gas consumption, net imports (inclusive of imports from Norway) and production from EU and EU + Norway.*

The recent economic slowdown reduced natural gas consumption and thus the need for imports. Now it seems like demand for natural gas in EU is growing.

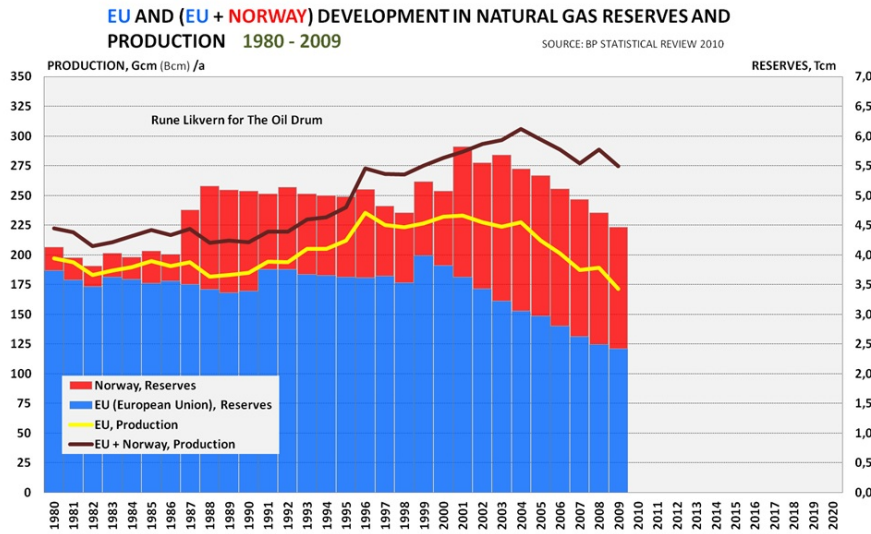


Figure 02: The stacked diagram shows developments in proven natural gas reserves for EU and Norway for the years 1980 - 2009. It also shows developments in production for the same.

EU + Norway’s proven natural gas reserves had a top in 2001 and have since been in steep decline. EU + Norway's production peaked in 2004 and is now in terminal decline. As of end of 2009, Netherlands held around 75 % of EU’s proven natural gas reserves.

PIPELINED NATURAL GAS

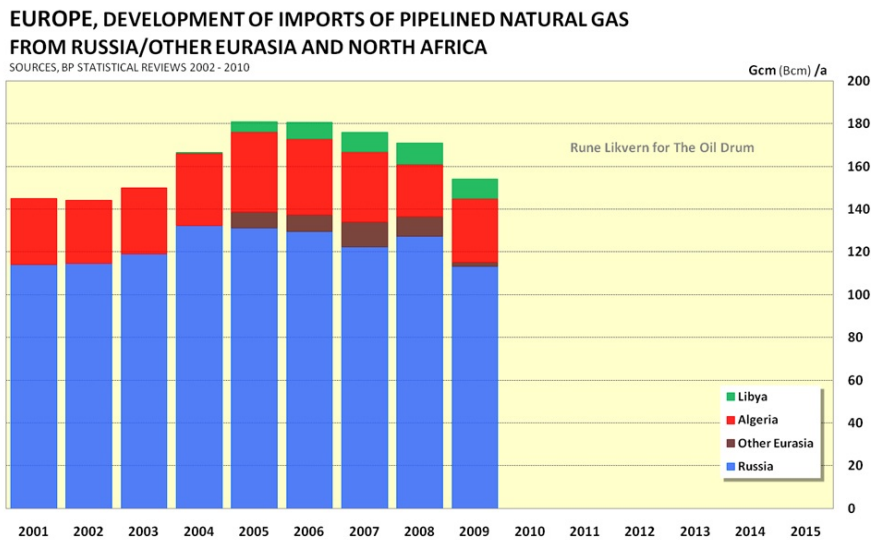


Figure 03: Above is shown developments in sources for Europe’s imports of natural gas by pipeline for the years 2001 - 2009.

Russia has been and is believed will continue to be the biggest supplier of natural gas for Europe. North Africa by Algeria and more recently Libya, has been and will continue to supply the Europe’s Mediterranean region with natural gas.

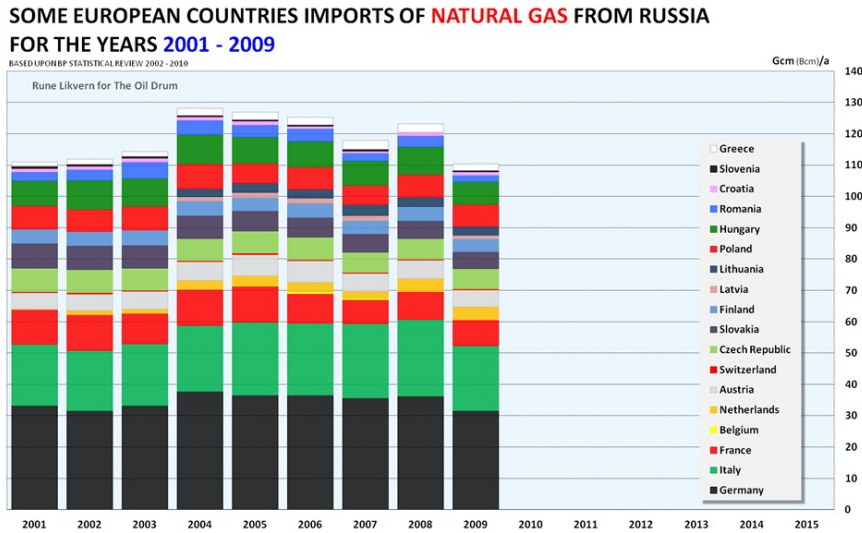


Figure 04: The stacked columns above shows how imports of natural gas from Russia for some European countries have developed for the years 2001 - 2009.

Germany and Italy have been big importers of natural gas from Russia. Countries close to Russia have supplemented their indigenous production with imports from Russia or been dependent on most of their natural gas supplies from Russia. Imports from Russia had a high in 2004 and has declined a little in recent years mainly due to the economic slowdown.

For my estimates on when Europe could experience future imbalances between supplies and demand I have assumed that Russia has the ability to increase natural gas supplies to Europe and thus allowed for future growth in Russian natural gas deliveries to Europe.

LNG (LIQUEFIED NATURAL GAS)

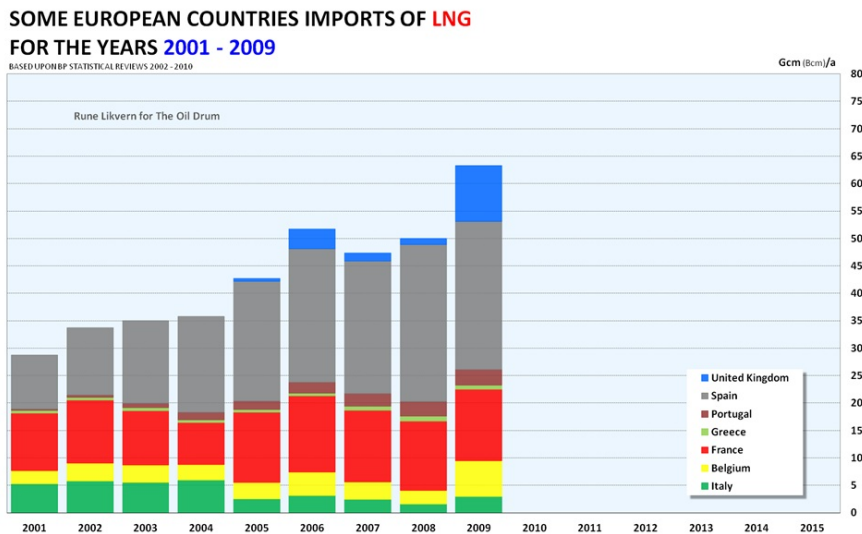


Figure 05: The stacked columns shows how supplies of LNG for some European countries have developed for the years 2001 - 2009.

LNG (Liquefied Natural Gas) has been one way for Europe to pursue a diversification in natural gas supplies. Spain which in recent years has had a strong economic growth has facilitated this also by growing energy consumption and for natural gas, primarily by LNG imports.

Recently UK has been a big importer of LNG and these imports will grow in the next few years. Interestingly this year's growth in U.K.'s LNG imports have facilitated increased exports of natural gas to Continental Europe, which could suggest that companies on Continental Europe have taken benefits of U.K.'s growing LNG import capabilities.

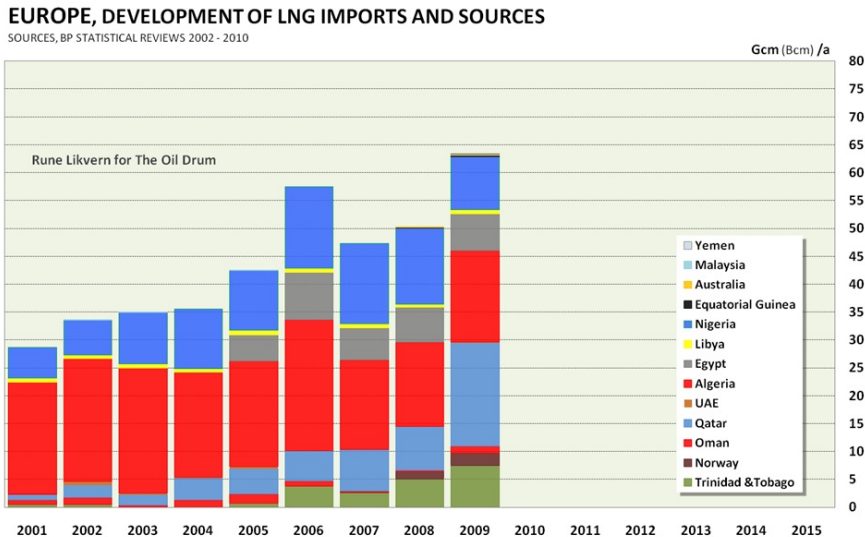


Figure 06: The diagram shows where Europe's imports of LNG has come from for the years 2001 - 2009.

LNG has a more global market than pipelined natural gas provided there are receiving facilities and provided specifications are met.

Earlier this decade, many LNG developments (like Snøhvit in Norway) were sanctioned in the anticipation of growing import needs for natural gas from the USA. The recent year's growth in unconventional natural gas production in the USA, primarily what is now referred to as shale gas, became what in many circles was referred to, a "game changer" which also affected the market for LNG. The supplies of unconventional gas led to a softening of the natural gas prices in the US market.

This is now reflected in how Europe imports its LNG which includes more distant sources as Trinidad & Tobago (ref the diagram above).

Some years ago Algeria experienced a fatal accident at one of their LNG plants that reduced their export capabilities. This explains the recent years' decline in European LNG imports from Algeria.

Qatar is now emerging as the biggest supplier of LNG for Europe; this is very much facilitated by the growing LNG receiving capabilities at the South Hook and Dragon in Wales.

THE FORECAST

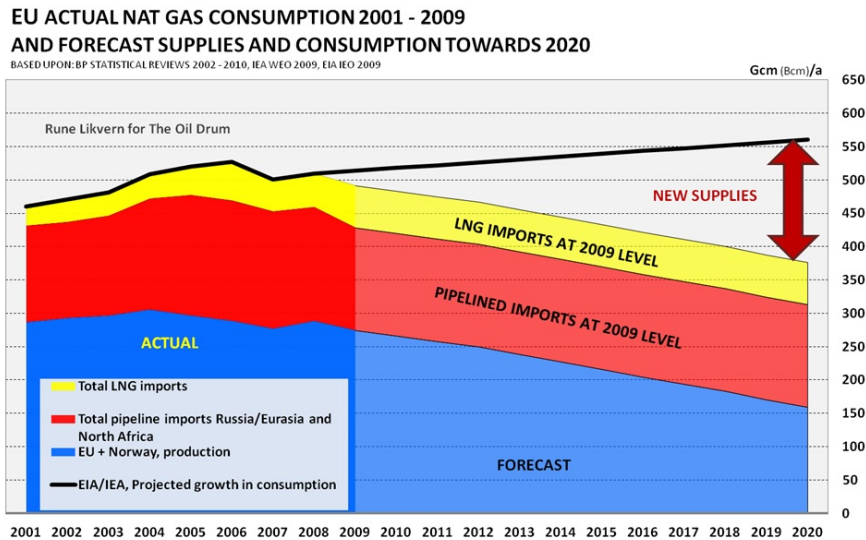


Figure 07: The diagram shows developments in actual natural gas consumption between 2001 and 2009 for EU, split on Europe's (inclusive of Norway's) own production and imports by pipeline and LNG. It also shows forecasts growth in demand (black line) towards 2020 from EIA and IEA. The light blue area is my projection of how Europe's natural gas production will develop towards 2020 and by showing pipeline and LNG imports at 2009 levels towards 2020, the diagram illustrates the growth in additional supplies from pipeline and LNG, if forecast demand is to be met.

NOTE. Production from Norway has been included in EU's production though formally Norway is not a full member of EU.

The forecast on EU + Norway's natural gas production is done with regard to developments in proven reserves, production and R/P (Reserves over Production) ratio for each European country.

For Norway (which production forecast is included in the light blue area), my forecast is based upon a field by field approach for all sanctioned fields as of end 2009 and where due considerations to NPD's (Norwegian Petroleum Directorate) data for proven reserves, production developments and R/P ratios has been given. My forecast for Norway results in growth in natural gas supplies until 2012 which then starts to decline.

At the beginning of this post, I described the possibility for an imbalance between European natural gas supplies and demand around 2011/2012. In my analysis I have allowed natural gas deliveries from Russia to Europe to grow above 130 Gcm/a by 2012 and assumed full utilization of U.K. LNG receiving facilities which is still being expanded.

IEA in their WEO 2009 have assumed a growth in European natural gas demand of 0,8 %/y and EIA in their IEO 2009 has assumed a growth of 1,0 %/y.

Presently I look upon the European natural gas market as being driven by three components; a) economic development, b) substitution from coal and nuclear to natural gas for electricity generation, and c) weather.

Substitution from coal and nuclear could be what now primarily drives European demand for natural gas, as recent data from U.K. suggests.

Allowing for growth in Russian and LNG supplies, it looks like European demand and supplies may become imbalanced by 2011/2012 and this gap may grow to 120 - 150 Gcm/a by 2020.

As of now, it is hard to see where such additional supplies will come from, if EIA/IEA projected demand by 2020 is to be met.

NORWAY AND RUSSIA

Presently Norway and Russia are the biggest suppliers of natural gas for EU.

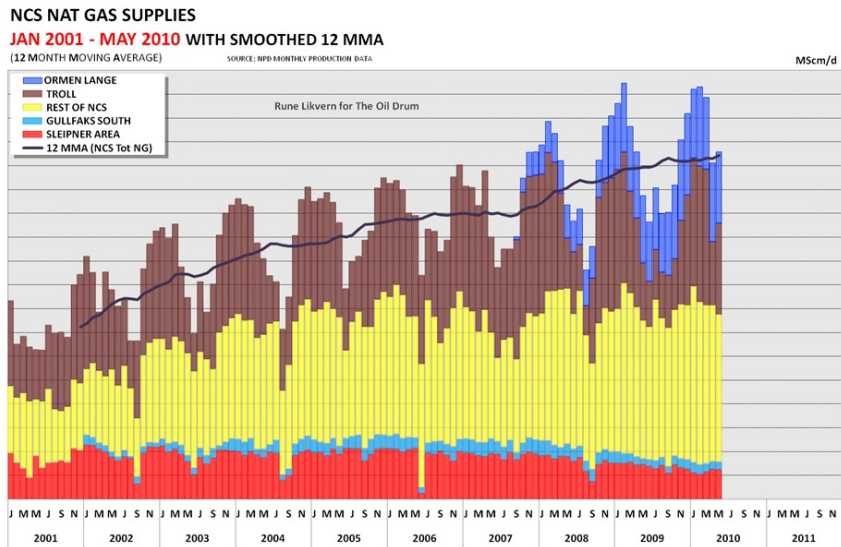


Figure 08: The above diagram shows development in Norway’s natural gas production by some individual fields and group of fields as reported by NPD (Norwegian Petroleum Directorate) for the period January 2001 and as of May 2010.

As of now it may look as Norwegian supplies are about to plateau as illustrated by the 12 MMA (Month Moving Average). The diagram shows how supplies from fields like Sleipner and Gullfaks South are now in decline due to depletion. The Troll field has been and will be a major supplier of natural gas. The diagram illustrates that recent growth in Norwegian supplies has primarily come from the Ormen Lange field.

The yellow columns shows all other fields and the diagram illustrates that new fields brought online primarily have helped offset declines from fields in decline like Sleipner and Gullfaks South.

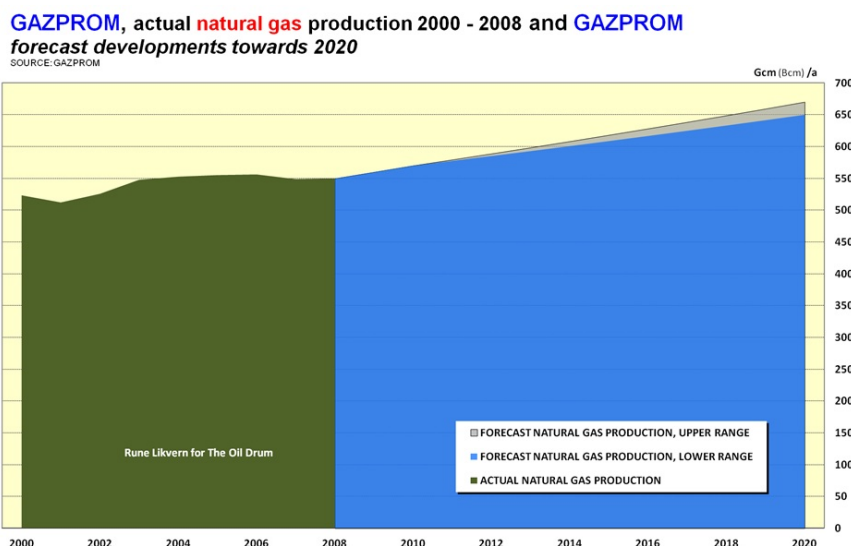


Figure 09: The diagram shows Gazprom’s production of natural gas for the years 2000 -

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2008. It further shows present projections by Gazprom on how their supplies will grow towards 2020.

The Russian gas giant Gazprom presently controls more than 85 % of Russian natural gas production and has a monopoly on exports on natural gas. Gazprom now projects their supplies to grow by around 100 Gcm/a relative to 2008 levels by 2020. This growth is for increased domestic consumption, growing exports to Asia (from Eastern Siberia to China and Japan), and some for other markets included the European.

As of now it appears as Gazprom is not planning to increase European deliveries to such an extent that they will cover a major part of the European natural gas supplies gap I have described here.

SOURCES:

[1] BP STATISTICAL REVIEWS OF WORLD ENERGY 2002 - 2010

[2] EIA, INTERNATIONAL ENERGY OUTLOOK 2009

[3] IEA, WORLD ENERGY OUTLOOK 2009

[4] IEA, MEDIUM-TERM OIL&GAS MARKETS 2010

[5] NATIONAL GRID, TEN YEAR STATEMENT 2009

[6] NPD, RESOURCES ACCOUNTING FOR NCS AS OF END 2009

[7] NPD, ACTUAL PRODUCTION FIGURES FOR NCS AS OF MAY 2010

[8] GAZPROM's WEBSITE



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